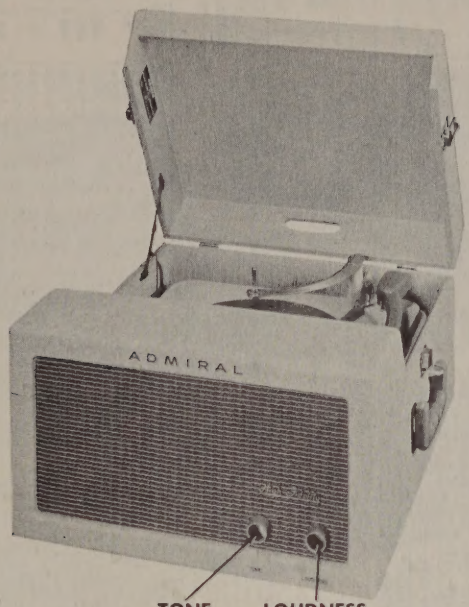
CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Admiral	4C26, 4C27, 4C28 (Ch. 4C2)	285-1
Bell Sound	2199B	285-2
Browning	RJ-43	285-3
Cal-Tech	Chassis T-1 Tel. Rec.	285-4
Capehart	23TP35BNL	285-5
Collaro	RC54 Record Changer	285-6
Coronado	TV2-9157A, TV2-9159A, TV2-9160A, TV2-9161A, TV2-9162A Tel. Rec.	285-7
Crescent	600	285-8
Crosley	H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445) Tel. Rec.	285-9
Electro-Voice	A-20C	285-10
Philco	C-1334, C-1340, C-1341, C-1342, C-1343	285-11
RCA Victor	5-C-591, 5-C-592 (Ch. RC-1148)	285-12
Regency	HF-200	285-13
Sylvania	510, 513, 520, 521, 526, 571, 573, 575, 576, 577, 613, 620, 621, 670, 675 Series (Ch. 1-521-1, -2, -3, -6, -7, -8) Tel. Rec.	285-14

RETMA MEMBER

ADMIRAL CHASSIS 4C2

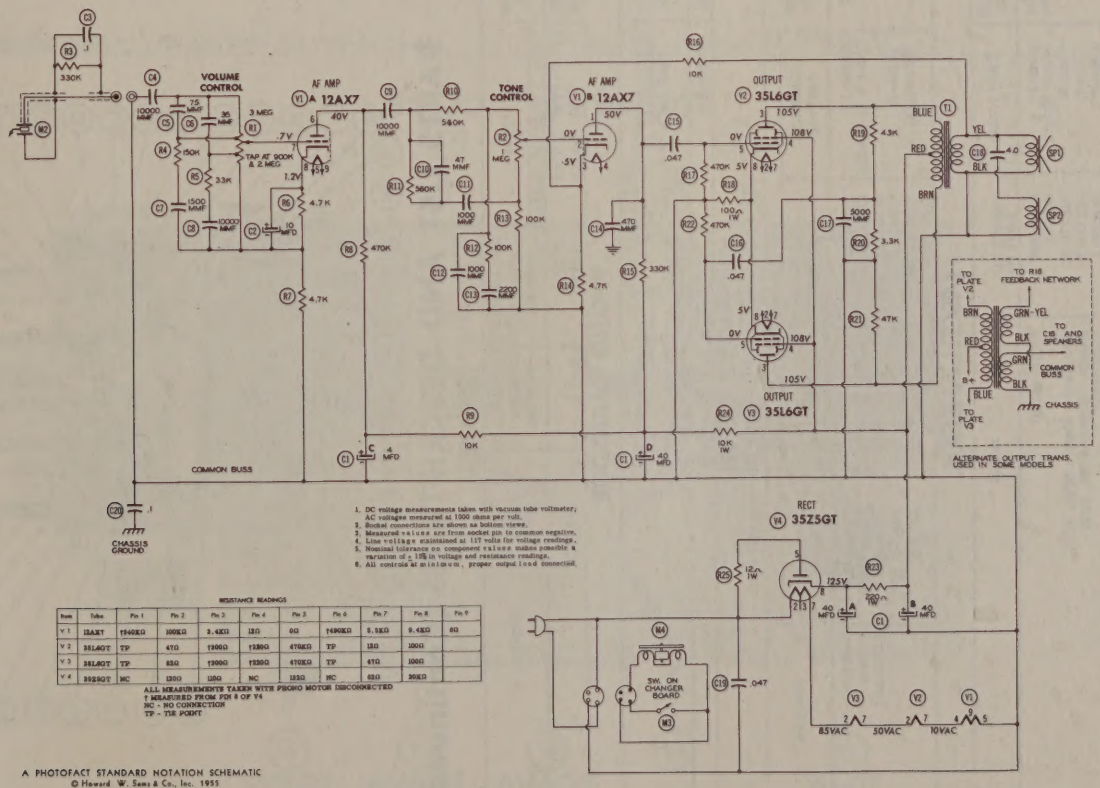
ADMIRAL CHASSIS 4C2



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Admiral Models 4C26, 4C27, 4C28 (Ch. 4C2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland, Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Four)	Types 12AX7 AF Amp., (2) 35L6GT Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.27 Amp. @ 117 Volts AC

RECORD CHANGER UNIT - MODEL RC-650



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	1940KΩ	100KΩ	2.4KΩ	1KΩ	0Ω	1490KΩ	2.5KΩ	2.4KΩ	0Ω
V 2	35L6GT	TP	47Ω	1200Ω	1250Ω	470KΩ	TP	1KΩ	100Ω	
V 3	35L6GT	TP	65Ω	1200Ω	1250Ω	470KΩ	TP	47Ω	100Ω	
V 4	35Z5GT	NC	120Ω	125Ω	NC	125Ω	NC	62Ω	30KΩ	

ALL MEASUREMENTS TAKEN WITH PHONO MOTOR DISCONNECTED
↑ MEASURED FROM PIN 8 OF V4
NC - NO CONNECTION
TP - TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier	12AX7	12AX7	9A	
V2	Audio Output	35L6GT	35L6GT	7S	
V3	Audio Output	35L6GT	35L6GT	7S	
V4	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.
C1A	40	150	67A4-12			CT3115	TDL-T40-150	FMT-1540
B	40	150				TC40	TD-4-150	FM-1504
C	4	150						
D	40	150						
C2	10	25	67B29-3			TC22	TD-10-25	FM-0210
C3	.1	400	64B5-5	DF-104		PT401	IMP4-P1	330401
C4	10000		65C10-3	DD-103	811-01	DC-511	IMP4-S1	330411
C5	75		65C6-70					
C6	35		65C6-10					
C7	1500		65C10-4	DD-152	801-0015	DC-5215	IMP6-D15	C-1215
C8	10000		65C10-3	DD-103	811-01	DC-511	IMP4-S1	330411
C9	10000		65C10-3	DD-103	811-01	DC-511	IMP4-S1	330411
C10	47	500	65C6-79	D6-470	GP1K-470			K-1447
C11	1000		65C6-92	D6-102	GP2L-102	UC-521	IMP6-D1	K-1210
C12	1000		65C6-92	D6-102	GP2L-102	UC-521	IMP6-D1	K-1210
C13	2200		65C10-42	D6-222	GP2-333-222	UC-5222	IMP6-D22	C-1222
C14	470	500	65C6-75	D6-471	GP2K-471			K-1347
C15	.047	200	64B9-9	DF-503		PT4147	IMP4-S47	3304147
C16	.047	200	64B9-9	DF-503		PT4147	IMP4-S47	3304147
C17	5000		65C10-1	DD-502	811-005	DC-525	IMP6-D5	C-1250
C18	4.0	10	64B13-1					
C19	.047	400	65A13-5	DF-503		PT4147	IMP4-S47	3304147
C20	.1	200	64B1-5	DF-104		PT401	IMP2-P1	330201

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3Meg	½	75B3-7					Loudness - tapped @ 900KΩ and 2Meg
R2A	1Meg	½	75C1-71	Q11-137	A47-1Meg-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A

RESISTORS

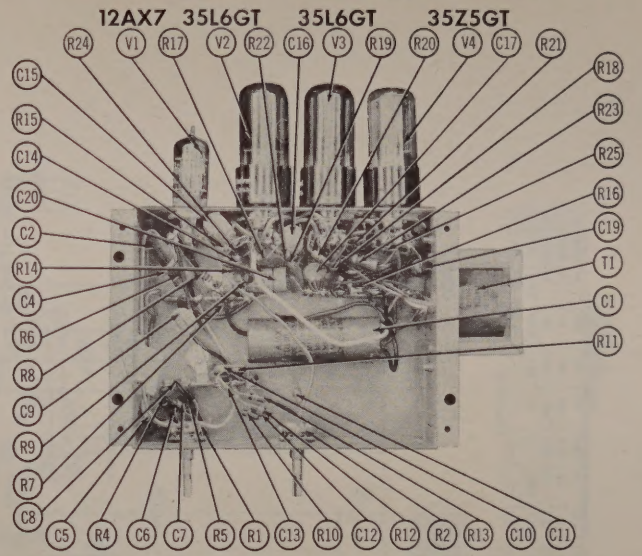
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R3	330KΩ	½	60B8-334	BTS-330K	
R4	150KΩ	½	60B9-154	BTS-150K	
R5	33KΩ	½	60B9-333	BTS-33K	
R6	4700Ω	½	60B9-472	BTS-4700	
R7	4700Ω	½	60B9-472	BTS-4700	
R8	470KΩ	½	60B9-474	BTS-470K	
R9	10KΩ	½	60B9-103	BTS-10K	
R10	560KΩ	½	60B9-564	BTS-560K	
R11	560KΩ	½	60B9-564	BTS-560K	
R12	100KΩ	½	60B9-104	BTS-100K	
R13	100KΩ	½	60B9-104	BTS-100K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R14	4700Ω	½	60B9-472	BTS-4700	
R15	330KΩ	½	60B9-334	BTS-330K	
R16	10KΩ	½	60B9-103	BTS-10K	
R17	470KΩ	½	60B9-474	BTS-470K	
R18	100Ω	1	60B14-101	BTA-100	
R19	43KΩ 5%	½	60B7-433	BTS-43K 5%	
R20	3300Ω	½	60B8-332	BTS-3300	
R21	47KΩ	½	60B8-473	BTS-47K	
R22	470KΩ	½	60B9-474	BTS-470K	
R23	220Ω	1	60B14-221	BTA-220	
R24	10KΩ	1	60B15-103	BTA-10K	
R25	12Ω	1	60B14-120		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4.6KΩ CT	3.4Ω	79C57-1 79C56-1 ②	Z1011	A-2935	A-3870	22S58 ①	S-55X ①	① Drill one new mounting hole. ② Used in Models with suffix N, has extra feedback winding.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	3½"	PM	3.2Ω	78B91-1		
SP2	8"	PM	3.4Ω	78B92-1	8A21	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: ADMIRAL PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1	409B19-8					

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: ADMIRAL PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	98B15-32 (33 1/3-45 Needle) 98B15-31 (78 Needle)	*JP-34LP or †JPS-34LP or ♦JPS-34LPD & *JP-34 or †JPS-34 or ♦JPS-34D		*W-34MGA or †W-34MGS & *W-34A or †W-34S	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Switch	G400A606	Reject-on-off
M4	Phono Motor	407C22	
	Cabinet	35E279-2	Mahogany - Models 4C26, 4C27
	Cabinet	35E279-2	Blonde - Models 4C26, 4C27
	Cabinet	35E309-2	Model 4D28
	Knob	33A81-9	Control - Models 4C26, 4C27
	Knob	33B81-11	Control - Model 4D28
	Handle	35E309-58	Carrying - Model 4D28
	Kit	98B15-24	50 Cycle conversion

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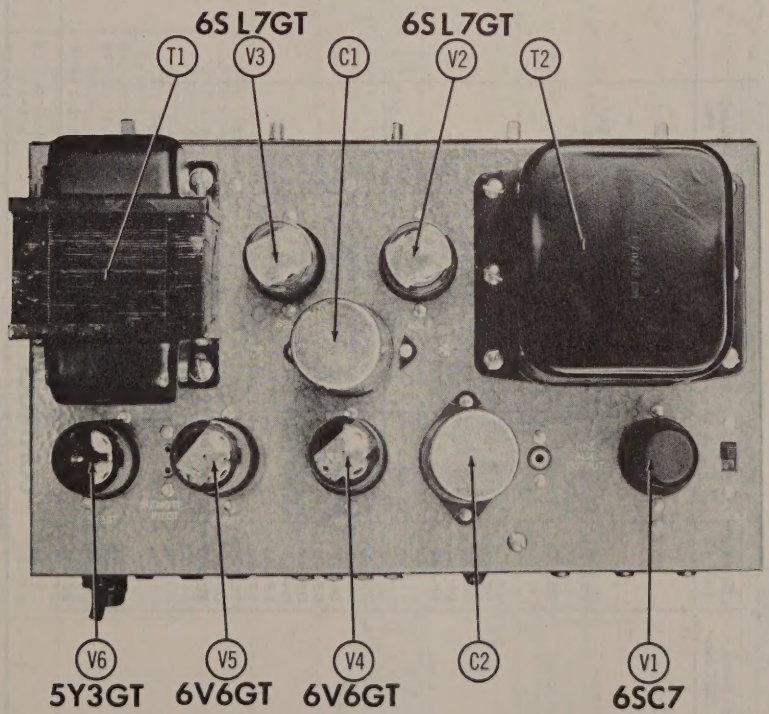
TRADE NAME	Bell Sound Model 2199B
MANUFACTURER	Bell Sound Systems, Inc., 555 Marion Rd., Columbus, Ohio
TYPE SET	AC Operated 12 Watt Audio Amplifier
TUBES (Six)	Types 6SC7 Preamp., 6SL7GT AF Amp., 6SL7GT AF Amp-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 50-60 Cycles RATING .68 Amp. @ 117 Volts AC



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PARTS LIST AND DESCRIPTIONS

BELL SOUND MODEL 2199B

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Bell Sound PART No.	STANDARD REPLACEMENT		
V1	Pre-Amp.	6SC7	6SC7	8S	
V2	AF Amp.	6SL7GT	6SL7GT	8BD	
V3	AF Amp. - Phase Inverter	6SL7GT	6SL7GT	8BD	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

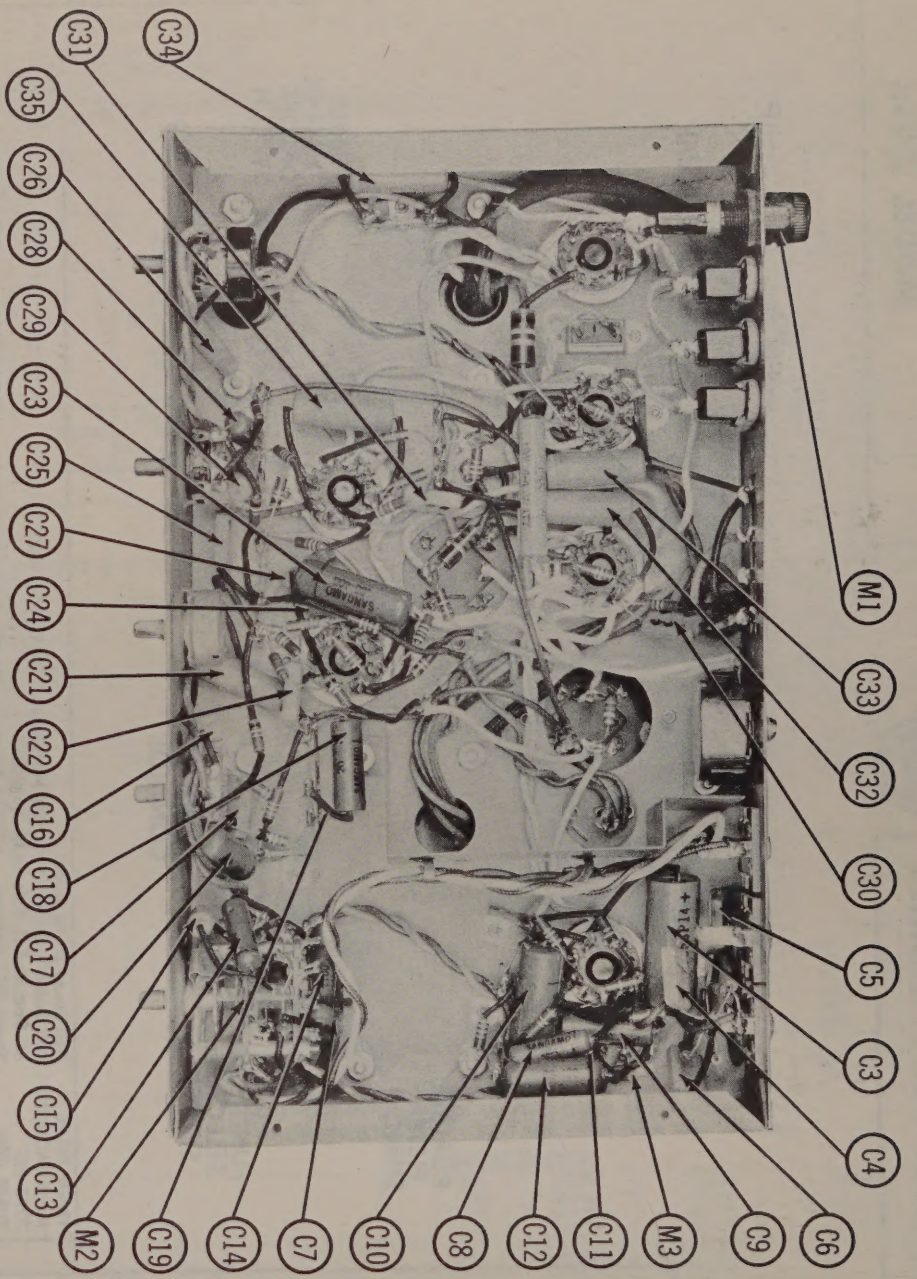
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	Bell Sound PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	■40	450				FP369.1	TM-3059	T-715	
B	▲40	450							
C	▲40	50				TP238	TM-D40-450	D-235	
C2A	▲40	450							
B	▲40	450				TC495	TD-150-50	MTH-1510	
C3	150	15				MCB235		KR-1310	
C4	100	500		TCZ-100	801-101			KR-1347	
C5	470	500			811-471			KR-1427	
C6	27	500		TCZ-27	831-270				
C7	.006	600							
C8	.004	400							
C9	.01	400							
C10	.1	400		DF-104		PT401	IMP4-P1	330401	
C11	.02	400		DF-203	817-02	PT412	IMP4-S2	330412	
C12	.02	400		DF-203	817-02	PT412	IMP4-S2	330412	
C13	.003	400		D6-302	811-003	PT623	IMP6-D3	330623	
C14	.0013	400						KR-1313	
C15	.00068	400			811-681			KR-1468	
C16	470	500			811-471			KR-1347	
C17	270	500		TCZ-270	831-271			KR-1327	
C18	.01	400		D6-103	811-102	PT411	IMP4-S1	330411	
C19	.01	400		D6-103	811-102	PT411	IMP4-S1	330411	
C20	.02	400		DF-203		PT412	IMP4-S2	330412	
C21	.05	400		DF-503		PT415	IMP4-S5	330415	
C22	15	500		D6-150	831-150			K-1415	
C23	.05	400		DF-503		PT415	IMP4-S5	330415	
C24	.05	400		DF-503		PT415	IMP4-S5	330415	
C25	200	500		TCZ-200	801-101	MCB237		KR-1320	
C26	.002	400		D6-202		PT622	IMP6-D2	330622	
C27	10	500		TCZ-10	831-100	MCB215		KR-1410	
C28	.001	600			811-102	MCB255		KR-1210	
C29	.01	400							
C30	200	500			811-201	MCB237		KR-1320	
C31	100	500			811-102	MCB235		KR-1310	
C32	.05	400		DF-503		PT415	IMP4-S5	330415	
C33	.05	400		DF-503		PT415	IMP4-S5	330415	
C34	.05	400		DF-503		PT415	IMP4-S5	330415	
C35	.05	400		DF-503		PT415	IMP4-S5	330415	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Bell Sound PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	½	B20066P103	Q13-139	A47-2Meg-Z	B-76-S	U-55	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	2Meg	½	B20066P102	Q13-139	A47-2Meg-Z	B-76	U-55	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	B20066P97	Q13-133	A47-500K-S	B-60	U-48	Gain
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4	250KΩ	½	B20066P125	Q13-130XX				Loudness tapped at 100KΩ and 150KΩ
R5A	100Ω	2	B20066P115	W-100	A43-100		R100L	Hum Balance
B	Shaft		Not Req.	Not Req.	FKS-1/4		Not Req.	Attach to R5A

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Bell Sound PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R6	47KΩ	¼		BTS-47K	
R7	27KΩ	¼		BTS-27K	
R8	150KΩ	¼		BTS-150K	
R9	1.2Meg	¼		BTS-1.2Meg	
R10	10KΩ	¼		BTS-10K	
R11	1000Ω	¼		BTS-1000	
R12	30KΩ 5%	¼		BTS-30K 5%	
R13	470KΩ	¼		BTS-470K	
R14	1.2Meg	¼		BTS-1.2Meg	
R15	36KΩ 5%	¼		BTS-36K 5%	
R16	75KΩ 5%	¼		BTS-75K 5%	
R17	330KΩ	¼		BTS-330K	
R18	150KΩ	¼		BTS-150K	
R19	27KΩ	¼		BTS-27K	
R20	27KΩ	¼		BTS-27K	
R21	27KΩ	¼		BTS-27K	
R22	100KΩ	¼		BTS-100K	
R23	470KΩ	¼		BTS-470K	
R24	2700Ω 5%	¼		BTS-2700 5%	
R25	100KΩ	¼		BTS-100K	
R26	220KΩ	¼		BTS-220K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Bell Sound PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R27	430KΩ 5%	¼		BTS-430K 5%	
R28	470KΩ	¼		BTS-470K	
R29	1300Ω 5%	¼		BTS-1300 5%	
R30	100KΩ	¼		BTS-100K	
R31	47KΩ	½		BTS-47K	
R32	200KΩ 5%	½		BTS-200K 5%	
R33	20KΩ 5%	½		BTS-20K 5%	
R34	27KΩ	½		BTS-27K	
R35	2000Ω 5%	½		BTS-2000 5%	
R36	100KΩ	½		BTS-100K	
R37	1.2Meg	½		BTS-1.2Meg	
R38	3300Ω	½		BTS-3300	
R39	130KΩ 5%	½		BTS-130K 5%	
R40	130KΩ 5%	½		BTS-130K 5%	
R41	18KΩ 5%	½		BTS-18K 5%	
R42	270KΩ	½		BTS-270K	
R43	250Ω	4		PW4-250	
R44	270KΩ	¼		BTS-270K	
R45	2700Ω	¼		BTS-2700	
R46	2200Ω	1		BTA-2200	
R47	100KΩ	2		BTB-100K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Bell Sound PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .68A	684VCT .088ADC	5VAC @ 2A	6.3VAC @ 1.9A	B-20243	P9310①②	P-3152①②	PC-8409①②	24R04U①②	R-11A①②

① Drill new mounting holes.
② Tape 6.3VCT.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Bell Sound PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	10KΩ CT	16Ω Tap @ 8Ω @ 4Ω	B-20242	H4103 ①	A-3132 ①	A-3311 ①	22S44 ①	S-31A ①	① Drill new mounting holes.

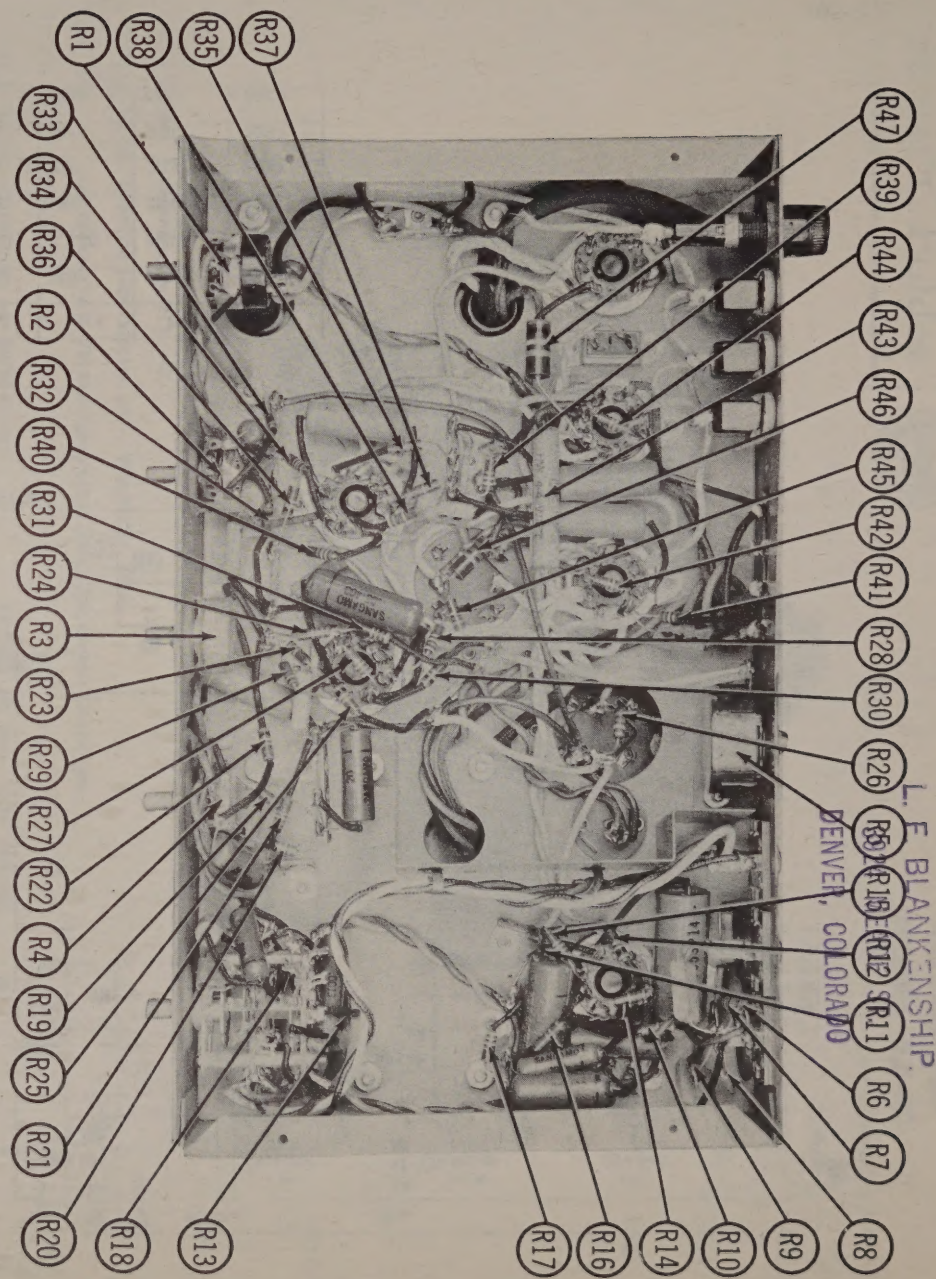
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Bell Sound PART No. FUSE	Bell Sound PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1½A 250V			31201.5 (3AG-1½A)	342001	AGC 1½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Bell Sound PART No.	NOTES
M2	Switch		Selector & Compensator (Rotary-Wafer type)
M3	Switch		On-Off-Rumble Filter (SPST - Slide type)

CHASSIS—BOTTOM VIEW



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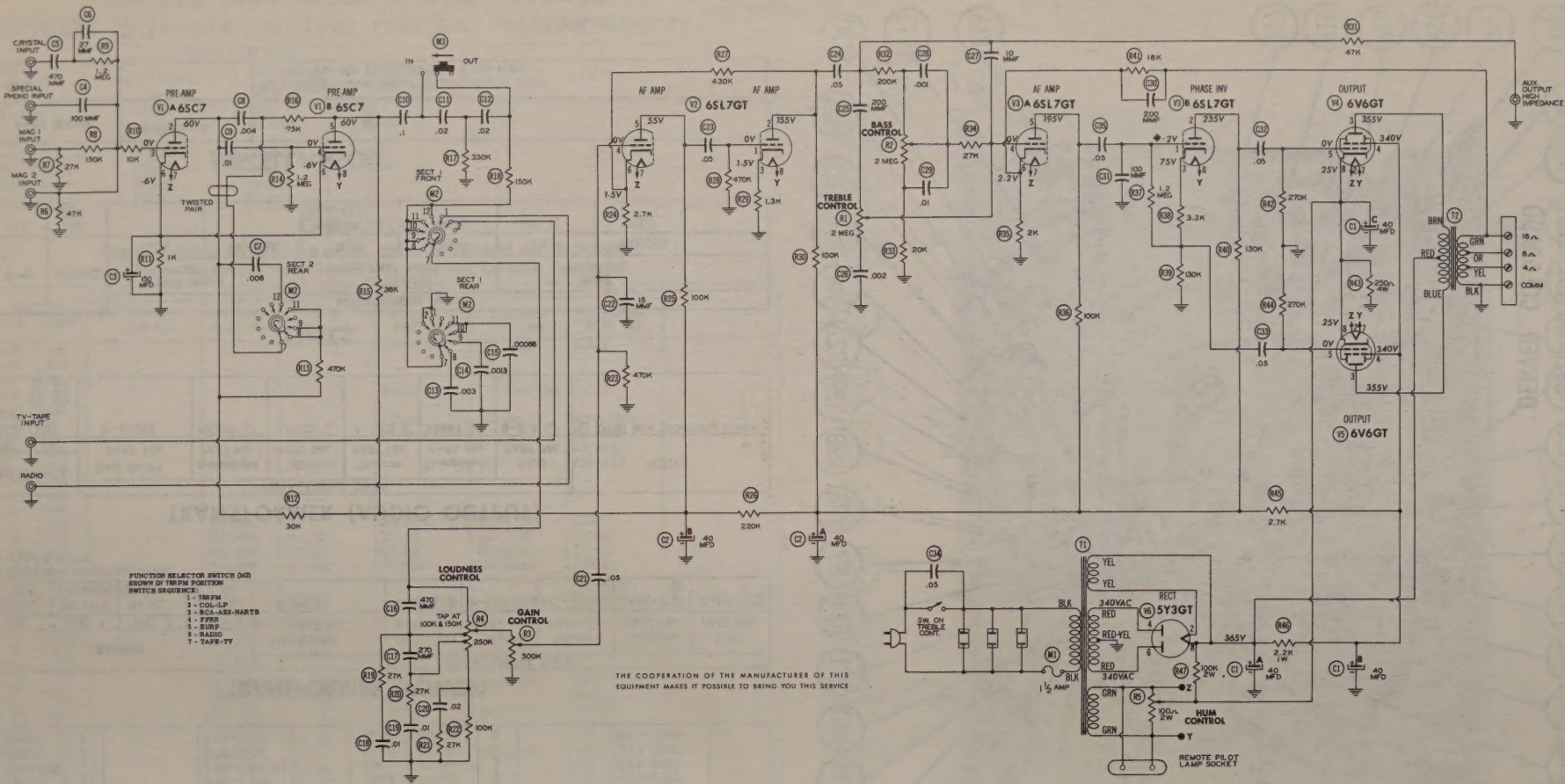

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	†220KΩ	50KΩ	1. 2Meg	†220KΩ	1KΩ	210Ω	210Ω
V 2	6SL7GT	470KΩ	†100KΩ	1. 3KΩ	470KΩ	†270KΩ	2. 7KΩ	210Ω	210Ω
V 3	6SL7GT	1. 3Meg	†134KΩ	133KΩ	50KΩ	†100KΩ	2KΩ	210Ω	210Ω
V 4	6V6GT	0Ω	210Ω	†250Ω	†2. 2KΩ	270KΩ	TP	210Ω	250Ω
V 5	6V6GT	0Ω	210Ω	†250Ω	†2. 2KΩ	270KΩ	NC	210Ω	250Ω
V 6	5Y3GT	NC	80KΩ	NC	110Ω	NC	110Ω	NC	80KΩ

† MEASURED FROM PIN 8 OF V6.
NC - NO CONNECTION
TP - TIE POINT
♦ MEASURED FROM PIN 3 OF V3

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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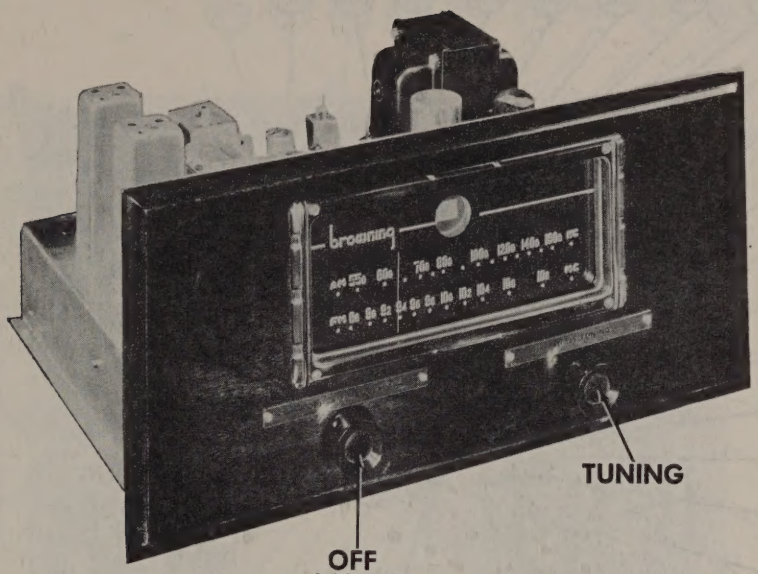
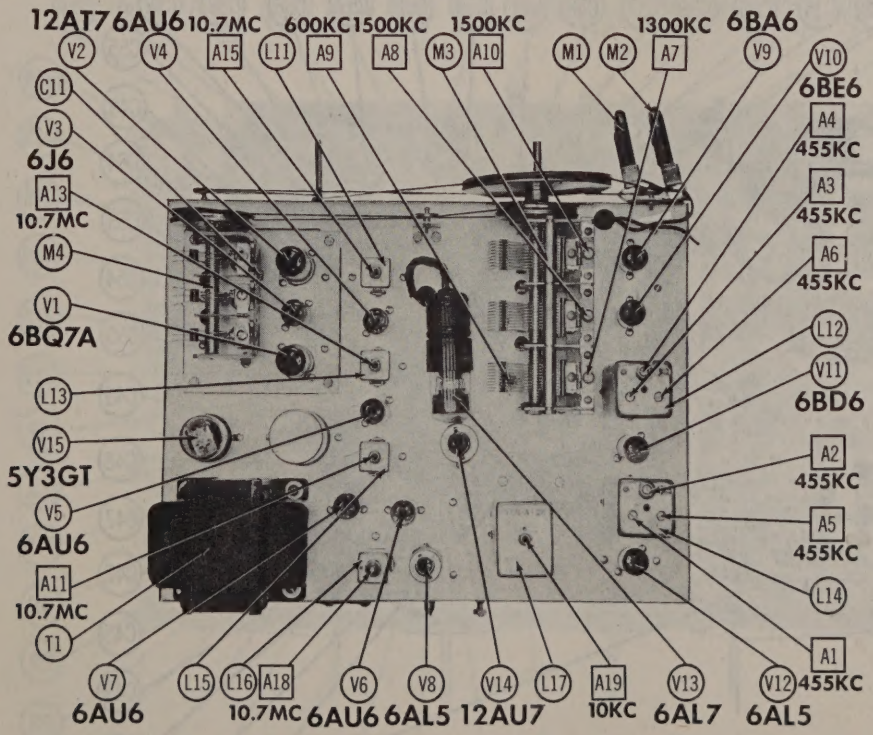


BROWNING
MODEL RJ-43

TRADE NAME	Browning Model RJ-43	
MANUFACTURER	Browning Laboratories, Inc., Winchester, Mass.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner For Custom Installation	
TUBES	Fifteen	
POWER SUPPLY	110-120 Volts AC- 50/60 Cycles	RATING .67 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	500-1700KC	FREQ. MOD. 88-108MC



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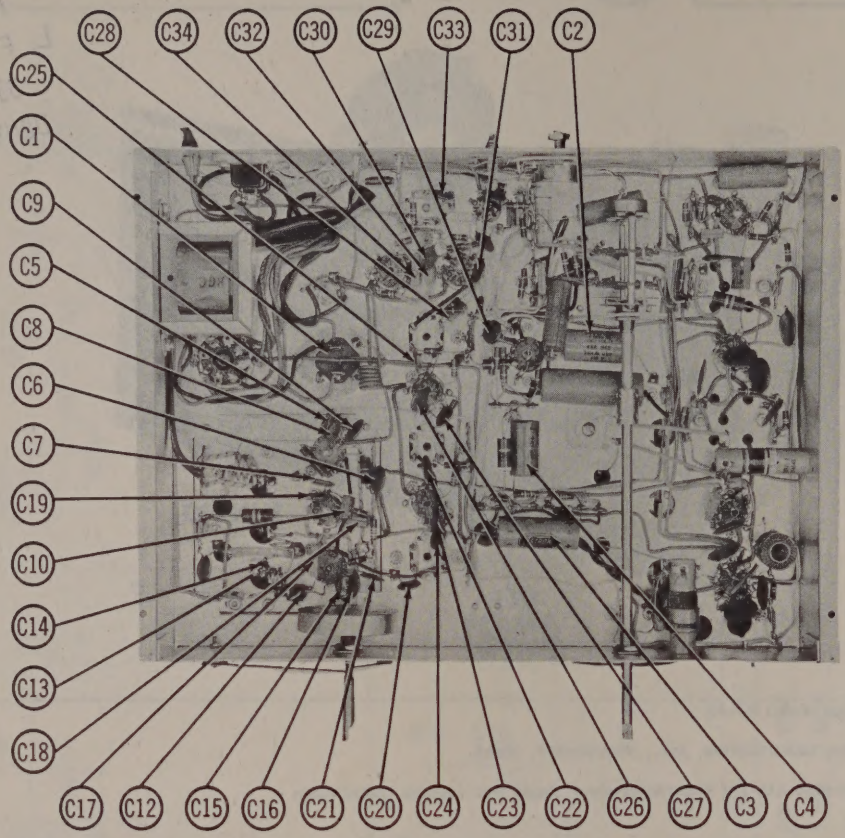
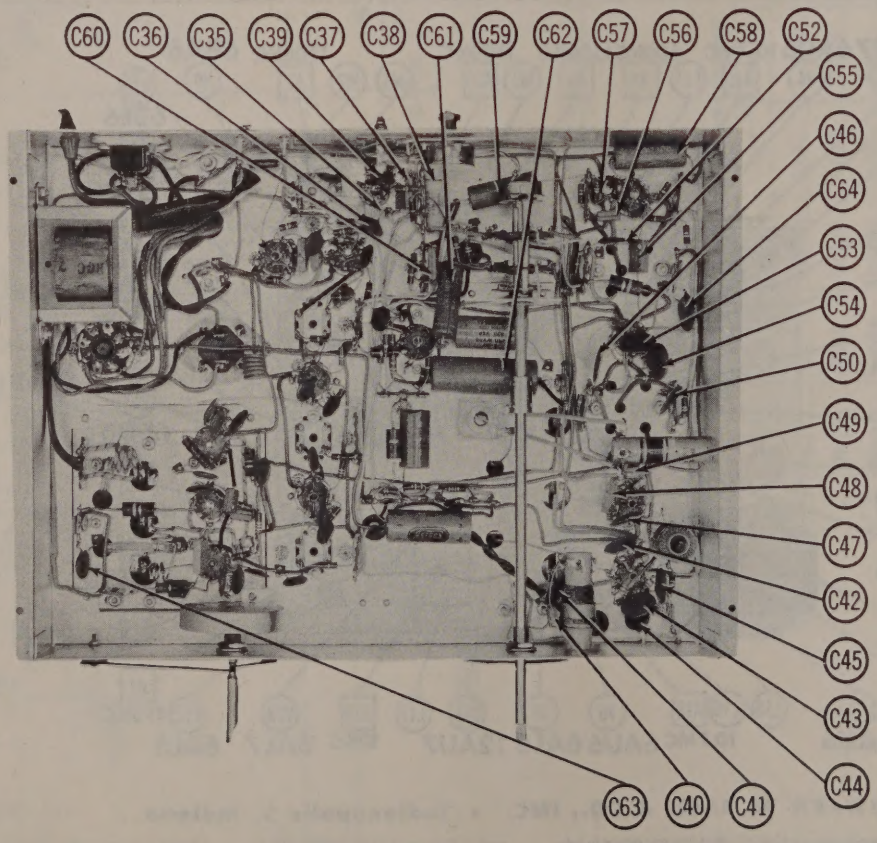
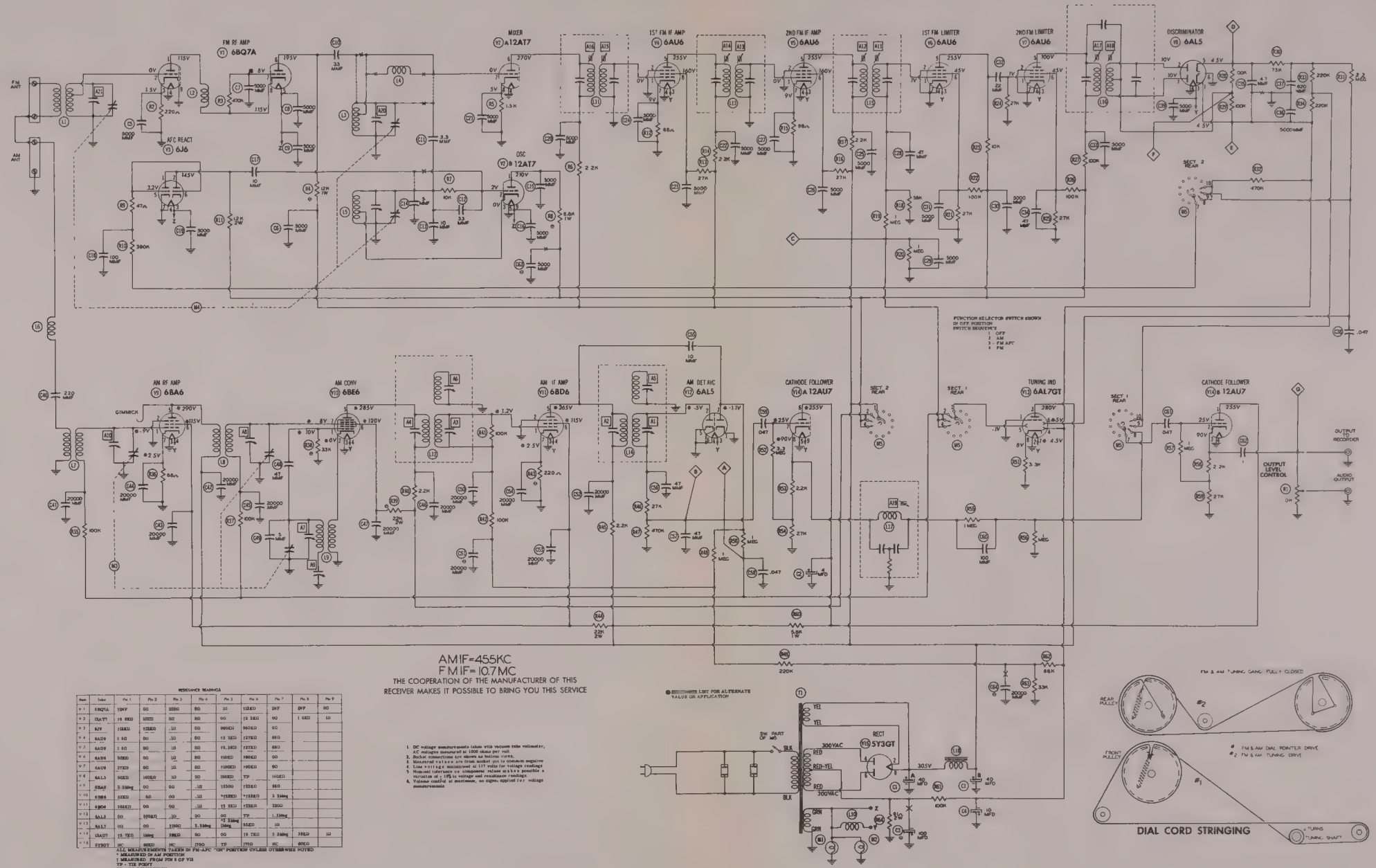




CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	12KΩ	0Ω	330Ω	0Ω	1Ω	12KΩ	2KΩ	2KΩ	0Ω
V 2	12AT7	19 KΩ	10KΩ	0Ω	0Ω	0Ω	12 KΩ	0Ω	1 KΩ	1Ω
V 3	6J6	12KΩ	12KΩ	1Ω	0Ω	0Ω	90KΩ	90KΩ	0Ω	
V 4	6AU6	1 MΩ	0Ω	1Ω	0Ω	13 MΩ	12MΩ	68Ω		
V 5	6AU6	1 MΩ	0Ω	1Ω	0Ω	13 MΩ	12MΩ	68Ω		
V 6	6AU6	90KΩ	0Ω	1Ω	0Ω	12MΩ	190KΩ	0Ω		
V 7	6AU6	27KΩ	0Ω	1Ω	0Ω	12MΩ	190KΩ	0Ω		
V 8	6AL5	90KΩ	140KΩ	1Ω	0Ω	0Ω	TP	140KΩ		
V 9	6BA6	3.3Meg	0Ω	0Ω	.1Ω	1350Ω	133KΩ	0Ω		
V 10	6BE6	33KΩ	0Ω	0Ω	.1Ω	*12KΩ	*12KΩ	3.3Meg		
V 11	6BD6	350KΩ	0Ω	0Ω	.1Ω	12 KΩ	12KΩ	220Ω		
V 12	6AL5	0Ω	190KΩ	1Ω	0Ω	0Ω	TP	1.3Meg		
V 13	6AL7	0Ω	0Ω	11MΩ	3.3Meg	*3.3Meg Delay	56KΩ	1Ω		
V 14	12AU7	19 KΩ	1Meg	28KΩ	0Ω	0Ω	18 KΩ	3.3Meg	28KΩ	1Ω
V 15	5Y3GT	HC	60KΩ	HC	11Ω	TP	11Ω	HC	60KΩ	

ALL MEASUREMENTS TAKEN IN FM-AFC "ON" POSITION UNLESS OTHERWISE NOTED
* MEASURED IN AM POSITION
† MEASURED FROM PIN 8 OF V12
TP - TIE POINT
HC - NO CONNECTION
◇ MEASURED FROM PIN 8 OF V1.

285-3

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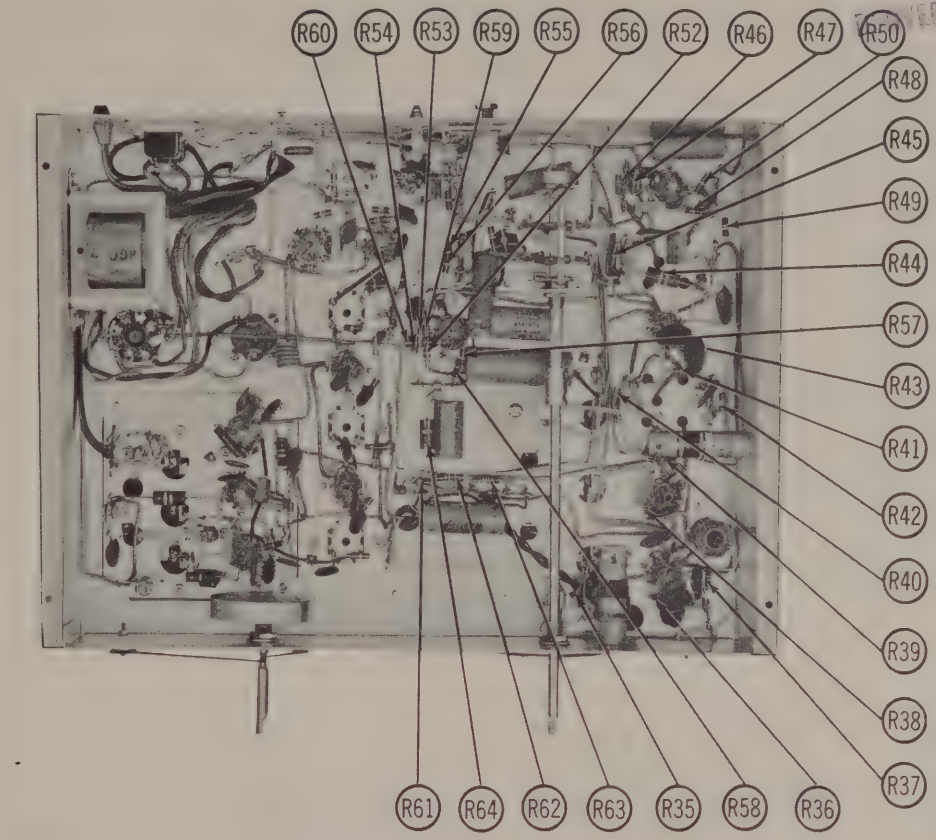
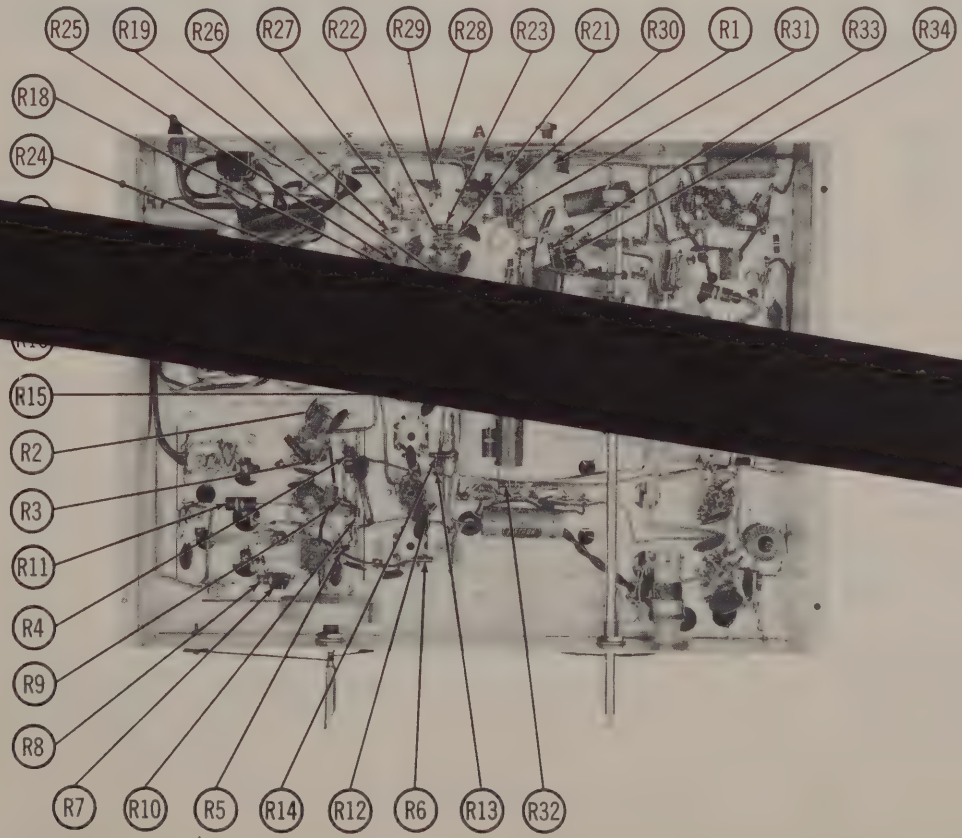




CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Output of signal generator should be no higher than necessary to obtain a usable indication on VTVM or scope.
Use an insulated alignment screwdriver for adjusting.

AM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to RF stator lug on tuning gang (middle section). Low side to chassis.	455KC (Unmod)	AM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6	Attenuate generator output to maintain less than -5 volts at VTVM. Adjust in order given for maximum deflection. Vary generator frequency to 453KC and 457KC and note meter deflection at both points. If meter deflection is not approximately the same at both points retouch A1 thru A6 until this condition is obtained.

AM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 30KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to RF stator lug on tuning gang (middle section). Low side to chassis.	455KC (Unmod)	AM	Tuning gang fully open	DC probe to point (B). Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for response similar to Fig 1.

10KC WHISTLE FILTER ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
2.	.01MFD	High side to RF stator lug on tuning gang (middle section). Low side to chassis.	455KC (10KC Mod)	AM	Tuning gang fully open	DC probe to point (G). Common to chassis.	A19	Adjust for MINIMUM deflection.

AM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	Direct	High side to AM antenna terminal. Low side to chassis.	1300KC	AM	1300KC	DC probe to point (A). Common to chassis.	A7	Adjust for maximum deflection.
4.	"	"	1500KC	"	1500KC	"	A8	"
5.	"	"	600KC	"	600KC	"	A9	Adjust for maximum deflection while rocking tuning gang thru 600KC signal. Repeat steps 3 and 4.
6.	Use original antenna system	Not used	Not used	"	See Remarks	"	A10	Tune in a station near 1500KC or 1600KC and adjust A10 for maximum deflection.

FIG.1

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod)	FM (AFC off)	Point of non-interference	DC probe to point (C). Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection. Vary the generator frequency in 25KC steps to 75KC above and below 10.7MC. The meter deflection should be nearly equ[illegible] low 10.7MC [illegible]
8.	"	"	"	"	"	"	"	"

FIG.2

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

[illegible] 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM (AFC off)	Point of non-interference	Vert. Amp. to point (F). Low side to point (E).	A11, A12, A13, A14, A15, A16, A17	Adjust for curve of maximum amplitude and symmetry with band pass as shown in Fig. 2.
8.	"	"	"	"	"	Vert. Amp. to point (D). Low side to point (E).	A18	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A17 for maximum amplitude and straightness of crossover lines. The linear portion of the crossover lines should extend for 150KC on either side of the 10.7MC marker as shown in Fig. 3. Continue alignment with step 10.

FIG.3

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each lead.	108MC (Unmod)	FM	108MC	DC probe to point (C). Common to chassis.	L5	Adjust for maximum deflection by compressing or expanding L5.
11.	"	"	88MC	"	88MC	"		SLIGHTLY spread or compress FM oscillator rotor plates (section nearest front panel) for maximum deflection.
12.	"	"	108MC	"	108MC	"	A20	Adjust for maximum deflection. Repeat steps 10 and 12 until maximum deflection is obtained at 108MC.
13.	"	"	88MC	"	88MC	"		Insert brass end of tuning wand in L4. If meter deflection increases spread the oscillator rotor plates VERY SLIGHTLY. Insert iron end of tuning wand in L4. If meter deflection increases compress oscillator rotor plates VERY SLIGHTLY. Repeat process in small steps until maximum deflection occurs at 88MC.
14.	"	"	108MC	"	108MC	"	A21	Adjust for maximum deflection.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

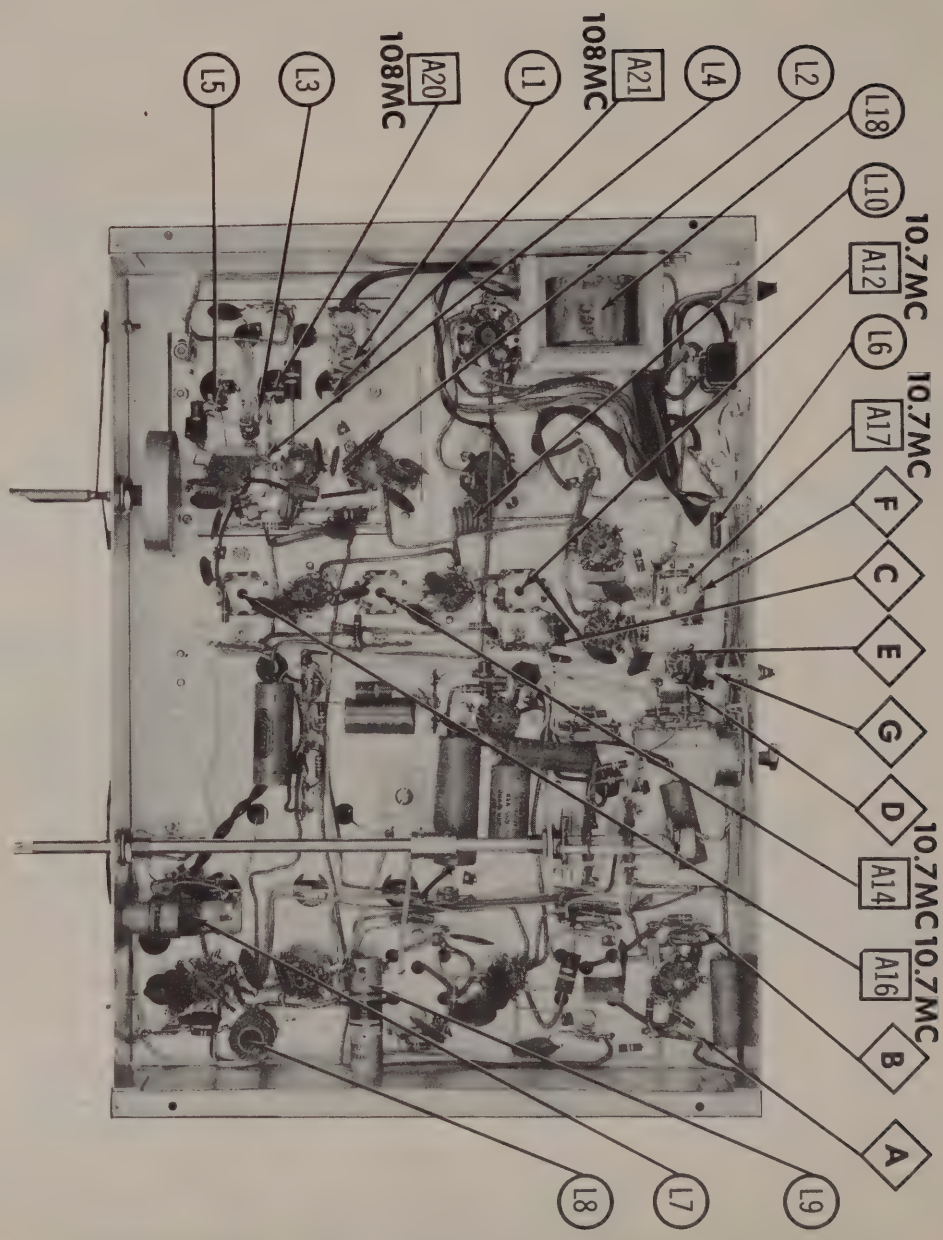
ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		BROWNING PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	FM Mixer-Osc.	12AT7	12AT7	9A	
V3	AFC Reactance	6J6	6J6	7BF	
V4	1st. FM IF Amp.	6AU6	6AU6	7BK	
V5	2nd. FM IF Amp.	6AU6	6AU6	7BK	
V6	1st. FM Limiter	6AU6	6AU6	7BK	
V7	2nd. FM Limiter	6AU6	6AU6	7BK	
V8	Discriminator	6AL5	6AL5	6BT	
V9	AM RF Amplifier	6BA6	6BA6	7BK	
V10	AM Converter	6BE6	6BE6	7CH	
V11	AM IF Amplifier	6BD6	6BD6	7BK	
V12	AM Det.-AVC	6AL5	6AL5	6BT	
V13	Tuning Indicator	6AL7GT	6AL7GT	8CH	
V14	AM Cathode Foll. Cathode Follower	12AU7	12AU7	9A	
V15	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	BROWNING PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲40	450				FP238	TM-D40-450	D-235	
B	■40	450							
C2	4	450				TC70	TD-4-450	FM-4504	
C3	100	25				TC2501	TD-100-25	MTH-2510	Note 1
C4	10	25				TC22	TD-10-25	FM-0210	
C5	5000			DD-502	811-005	DC-525		C-1250	
C6	5000			DD-502	811-005	DC-525		C-1250	
C7	5000			DD-502	811-005	DC-525		C-1250	
C8	5000			DD-502	811-005	DC-525		C-1250	
C9	5000			DD-502	811-005	DC-525		C-1250	
C10	33	500		TCZ-33	NP0L-330	ZT-5433		KR-1433	
C11	3.3			TCZ-3R3	NP0A-3R3	ZT-5533			
C12	33			TCZ-33	NP0L-330	ZT-5433		KR-1433	
C13	10								
C14	5			TCN-5	N750A-050				
C15	5000			DD-502	811-005	DC-525		C-1250	
C16	5000			DD-502	811-005	DC-525		C-1250	
C17	10	500		TCZ-10	NP0A-100	MCB215		KR-1410	
C18	100	500		TCZ-100	NP0-337-101	MCB235		KR-1310	
C19	5000			DD-502	811-005	DC-525		C-1250	
C20	5000			DD-502	811-005	DC-525		C-1250	
C21	5000			DD-502	811-005	DC-525		C-1250	
C22	5000			DD-502	811-005	DC-525		C-1250	
C23	5000			DD-502	811-005	DC-525		C-1250	
C24	5000			DD-502	811-005	DC-525		C-1250	
C25	5000			DD-502	811-005	DC-525		C-1250	
C26	5000			DD-502	811-005	DC-525		C-1250	
C27	5000			DD-502	811-005	DC-525		C-1250	
C28	47	500		TCZ-47	NP0-338-470	ZT-5447		KR-1447	
C29	5000			DD-502	811-005	DC-525		C-1250	
C30	5000			DD-502	811-005	DC-525		C-1250	
C31	5000			DD-502	811-005	DC-525		C-1250	
C32	22	500		TCZ-22	NP0K-220			KR-1422	
C33	5000			DD-502	811-005	DC-525		C-1250	
C34	47	500		TCZ-47	NP0-338-470	ZT-5447		KR-1447	
C35	47	500		TCZ-47	NP0-338-470	ZT-5447		KR-1447	
C36	5000			DD-502	811-005	DC-525		C-1250	
C37	620	500						KR-1362	
C38	.047	200		DF-503		PT4147	IMP2-S47	3302147	
C39	5000			DD-502	811-005	DC-525		C-1250	
C40	220	500		TCZ-220	NP0-335-221			KR-1322	
C41	20000			DD-203	817-02				
C42	20000			DD-203	817-02				
C43	20000			DD-203	817-02				
C44	20000			DD-203	817-02				
C45	20000			DD-203	817-02				
C46	20000			DD-203	817-02				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BROWNING PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C47	20000			DD-203	817-02				
C48	47	500		TCZ-47	NP0-338-470	ZT-5447		KR-1447	
C49	5	500			NP0A-050	ZT-555		KR-1550	
C50	20000			DD-203	817-02				
C51	20000			DD-203	817-02				Note 1
C52	20000			DD-203	817-02				
C53	20000			DD-203	817-02				
C54	20000			DD-203	817-02				
C55	10	500		TCZ-10	NP0A-100	MCB215		KR-1410	
C56	47	500		TCZ-47	NP0-338-470	ZT-5447		KR-1447	
C57	47	500		TCZ-47	NP0-338-470	ZT-5447		KR-1447	
C58	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C59	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C60	100	500		TCZ-100	NP0-337-101	MCB235		KR-1310	
C61	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C62	1	200				AG452	CT2-1	330210	
C63	5000			DD-502	811-005	DC-525		C-1250	Note 1
C64	20000			DD-203	817-02				Note 1

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BROWNING PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	10KΩ	½	SX-1931	Q11-116	A47-10K-S	AB-14	SU-20	Output level set
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA BROWNING PART No.	IRC PART No.	NOTES
R2	220Ω	½		BTS-220	
R3	470KΩ	½		BTS-470K	
R4	12KΩ	1		BTA-12K	Note 1
R5	1500Ω	½		BTS-1500	
R6	2200Ω	½		BTS-2200	
R7	10KΩ	½		BTS-10K	
R8	6800Ω	1		BTA-6800	Note 1
R9	47Ω	½		BTS-47	
R10	390KΩ	½		BTS-390K	
R11	12KΩ	2		BTB-12K	
R12	68Ω	½		BTS-68	
R13	27KΩ	½		BTS-27K	
R14	2200Ω	½		BTS-2200	
R15	68Ω	½		BTS-68	
R16	27KΩ	½		BTS-27K	
R17	2200Ω	½		BTS-2200	
R18	56KΩ	½		BTS-56K	
R19	1Meg	½		BTS-1Meg	
R20	1Meg	½		BTS-1Meg	
R21	27KΩ	½		BTS-27K	
R22	100KΩ	½		BTS-100K	
R23	10KΩ	½		BTS-10K	
R24	27KΩ	½		BTS-27K	
R25	27KΩ	½		BTS-27K	
R26	100KΩ	½		BTS-100K	
R27	100KΩ	½		BTS-100K	
R28	100KΩ	½		BTS-100K	
R29	100KΩ	½		BTS-100K	
R30	75KΩ 5%	½		BTS-75K 5%	
R31	2.2Meg	½		BTS-2.2Meg	
R32	470KΩ	½		BTS-470K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA BROWNING PART No.	IRC PART No.	NOTES
R33	220KΩ	½		BTS-220K	
R34	220KΩ	½		BTS-220K	
R35	100KΩ	½		BTS-100K	
R36	68Ω	½		BTS-68	
R37	100KΩ	½		BTS-100K	
R38	33KΩ	½		BTS-33K	Note 2
R39	22KΩ	2		BTB-22K	Note 3
R40	2200Ω	½		BTS-2200	
R41	100KΩ	½		BTS-100K	
R42	100KΩ	½		BTS-100K	
R43	220Ω	½		BTS-220	Note 4
R44	22KΩ	2		BTB-22K	
R45	2200Ω	½		BTS-2200	
R46	27KΩ	½		BTS-27K	
R47	470KΩ	½		BTS-470K	
R48	1Meg	½		BTS-1Meg	
R49	220KΩ	½		BTS-220K	
R50	1Meg	½		BTS-1Meg	
R51	3300Ω	½		BTS-3300	
R52	3.3Meg	½		BTS-3.3Meg	
R53	2200Ω	½		BTS-2200	
R54	27KΩ	½		BTS-27K	
R55	1Meg	½		BTS-1Meg	
R56	1Meg	½		BTS-1Meg	
R57	1Meg	½		BTS-1Meg	
R58	2200Ω	½		BTS-2200	
R59	27KΩ	½		BTS-27K	
R60	5600Ω	1		BTA-5600	
R61	100KΩ	½		BTS-100K	
R62	68KΩ	½		BTS-68K	
R63	33KΩ	½		BTS-33K	
R64	91Ω	2			

Note 1. Some versions use a 10KΩ resistor in this application.
Note 2. Some versions use a 27KΩ resistor in this application.
Note 3. Some versions use a 2200Ω resistor in this application.
Note 4. Some versions use a 240Ω resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA BROWNING PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .67A	580VCT .083A	5VAC @ 2A	6.3VAC @ 4.1A		P9312 ① ②		PC-8405 ① ②	22R05 ①	R-12A ① ②

① Drill new mounting holes.
② Tape 6.3V center tap.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA BROWNING PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω	0Ω					
L2	Neut. Coil	.1Ω			19-1000	TV-189	4602	1 Microhenries Tapped
L3	FM RF Coil	0Ω						
L4	Parasitic Suppressor	0Ω						Not used in all versions
L5	FM Osc. Coil	0Ω						Tapped
L6	AM Ant. Loading Coil	.6Ω			19-1004		4610	5 Microhenries
L7	AM Ant. Coil	4.8Ω	3.9Ω		14-1056	BC-380	72-A	
L8	AM RF Coil	90Ω	3.3Ω		14-1023	BC-413	43-RF	
L9	AM Osc. Coil	.7Ω	9.5Ω	16979-1	14-4034	BC-397	5480-C	
L10	Fil. Choke	0Ω						Not used in all versions
L11	1st. FM IF	1.2Ω	1.2Ω	16486-1	16-3487	FM-254	1463	
L12	1st. AM IF	16Ω	16Ω	14487				
L13	2nd. FM IF	1.2Ω	1.2Ω	16486-1	16-3487	FM-254	1463	
L14	2nd. AM IF	16Ω	16Ω	14488				
L15	3rd. FM IF	1.2Ω	1.2Ω	16486-1	16-3487	FM-254	1463	
L16	Discriminator	1.2Ω	1.5ΩCT	15808	17-3494	FM-253	1464	
L17	10KC Filter	110Ω						Includes caps and resistor

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA BROWNING PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L18	.083ADC	154Ω	5.1 Hy.		C502 ①		C-1709	20C64 ①	C-9X

① Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	BROWNING PART No.	NOTES
M1	Dial Light		#1830
M2	Dial Light		#1830
M3	Tuning Cap.		AM-3Gang-(22-385MMF, 22-385MMF)
M4	Tuning Cap.		FM-3Gang
M5	Switch		On-Off-Selector
A9	Trimmer Cap.	303-M	AM Osc. Coil padder

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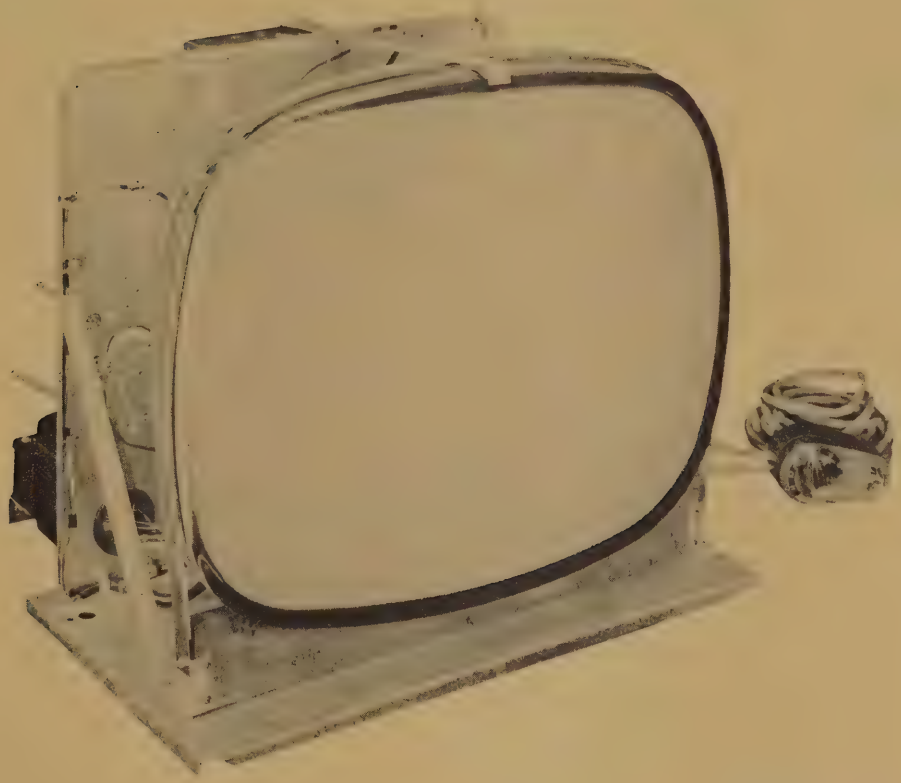

CHASSIS T-1

CAL-TECH
CHASSIS T-1

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CAL-TECH CHASSIS T-1

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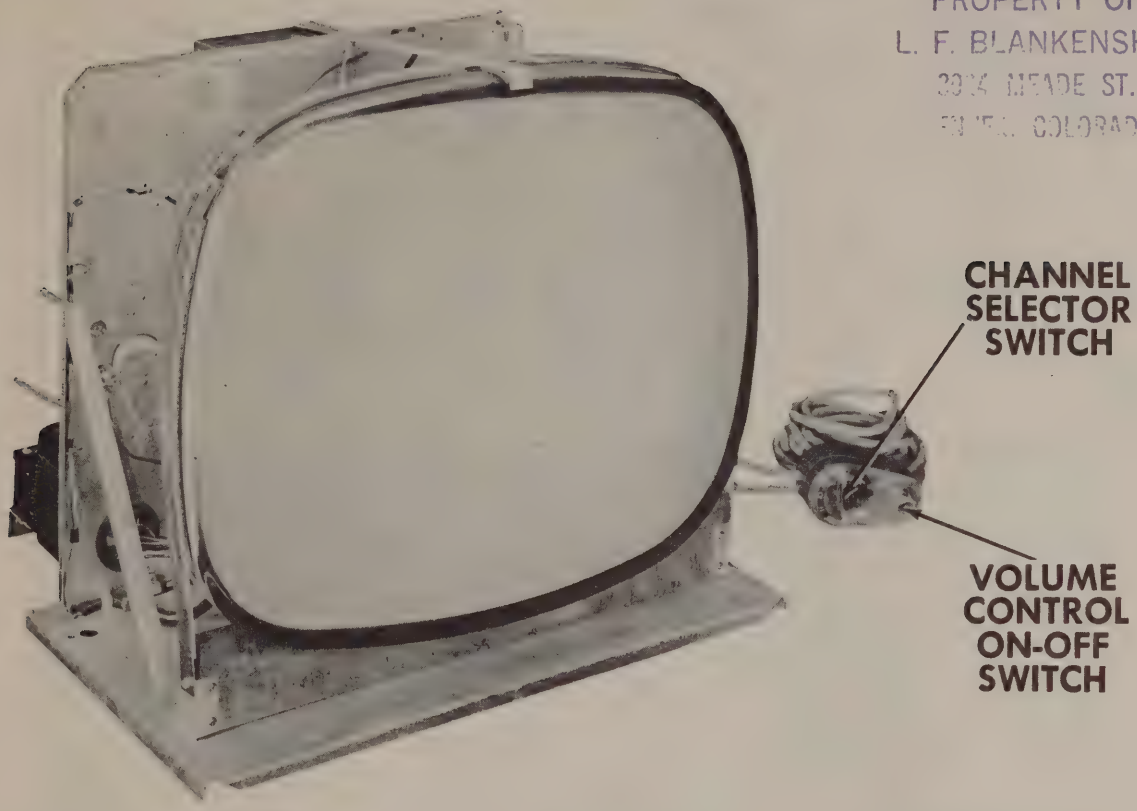

CAL-TECH CHASSIS T-1

TRADE NAME	Cal-Tech Chassis T-1
MANUFACTURER	Cal-Tech Electronics Corp.,8930 Lindblade St., Culver City, California
TYPE SET	Television Receiver
TUBES	Twenty-six
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.76 Amp. @ 117 Volts AC
TUNING RANGE—	Channel 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 14, 15, 16
Photographs
- Chassis-Rear View 11
- Chassis-Top View 3
- RF Tuner 10
- Remote Head 19
- Sub-Chassis (#1) Video IF Unit 4
- Sub-Chassis (#2) Video Output Unit 4
- Sub-Chassis (#3) Sound IF Unit 8
- Sub-Chassis (#4) LV Power Supply 9
- Sub-Chassis (#5) Horiz. Osc. Unit 13
- Sub-Chassis (#6B) Vert. Unit 13
- Sub-Chassis (#7) Sync Unit 17
- Sub-Chassis (#8) HV Unit 18
- Sub-Chassis (#9) Video Control Unit 19
- Sub-Chassis (#10A) Audio Output Unit 20
- Sub-Chassis (#11) RF Tuner-Top View 20

Resistance Measurements 8
Servicing in the Field 18
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Top View) 5

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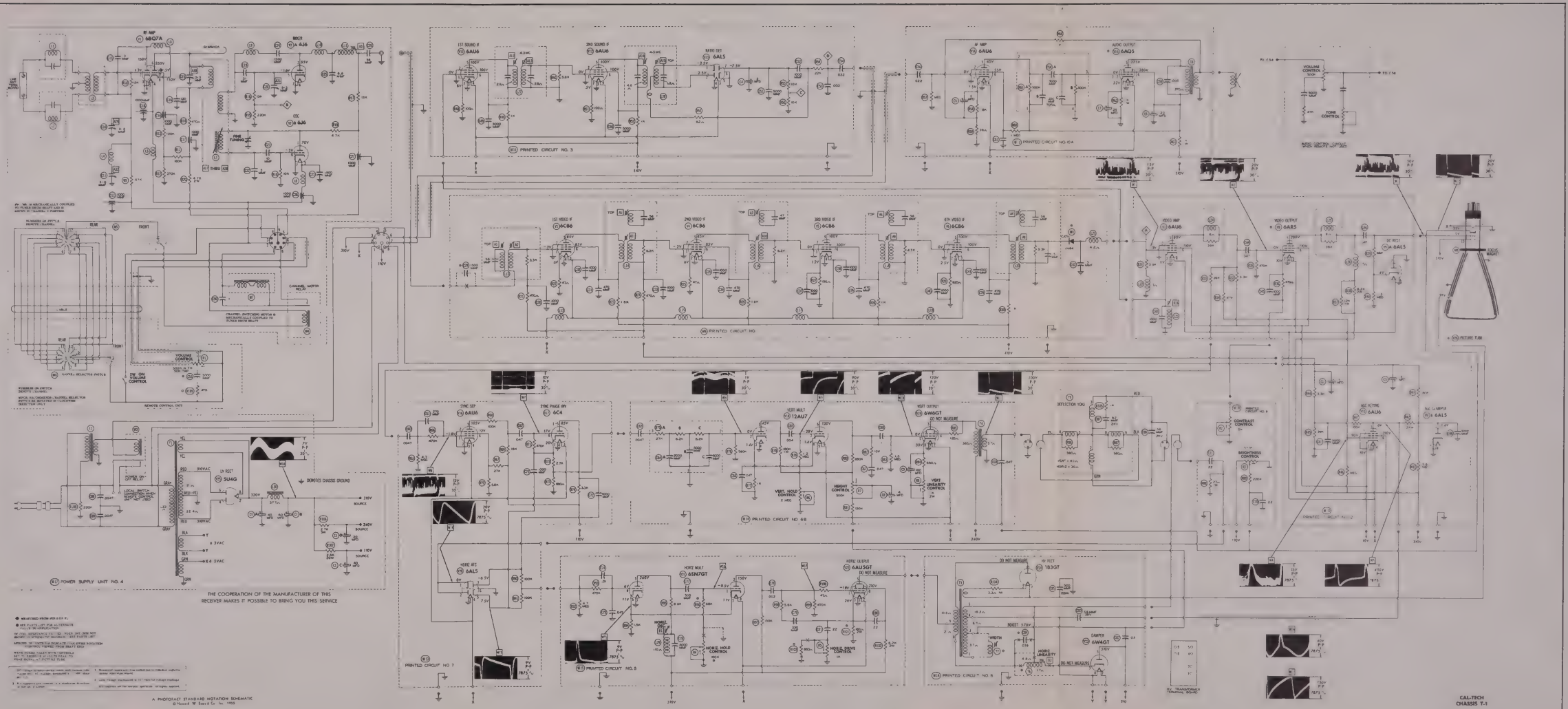
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CHASSIS T-1
THE COOPERATION OF THE MANUFACTURER OF THIS
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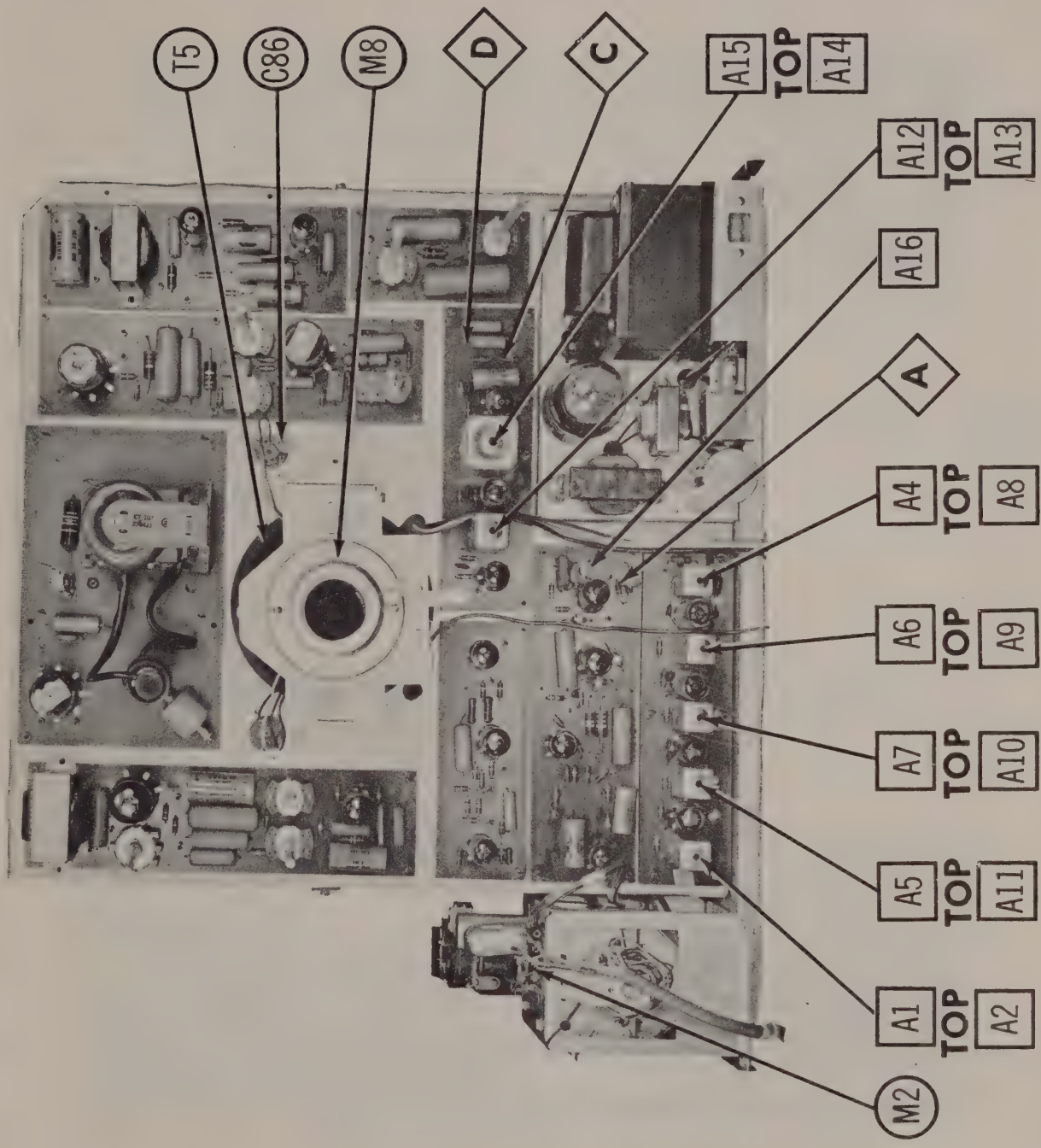

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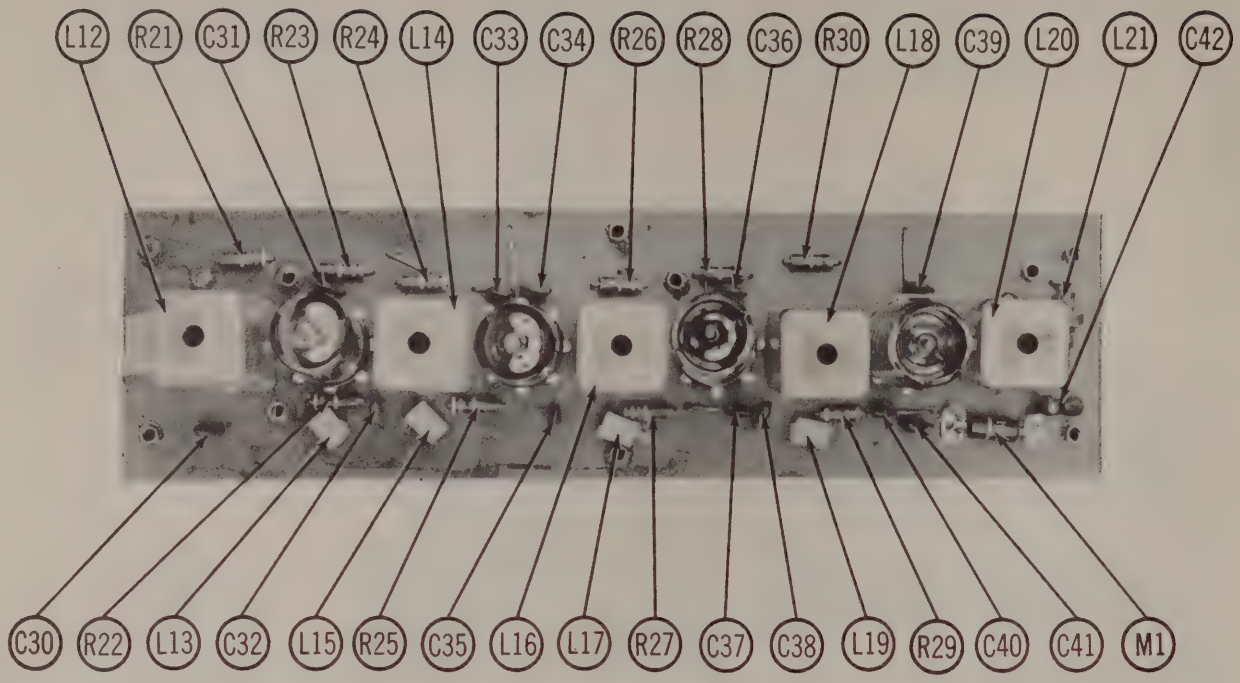
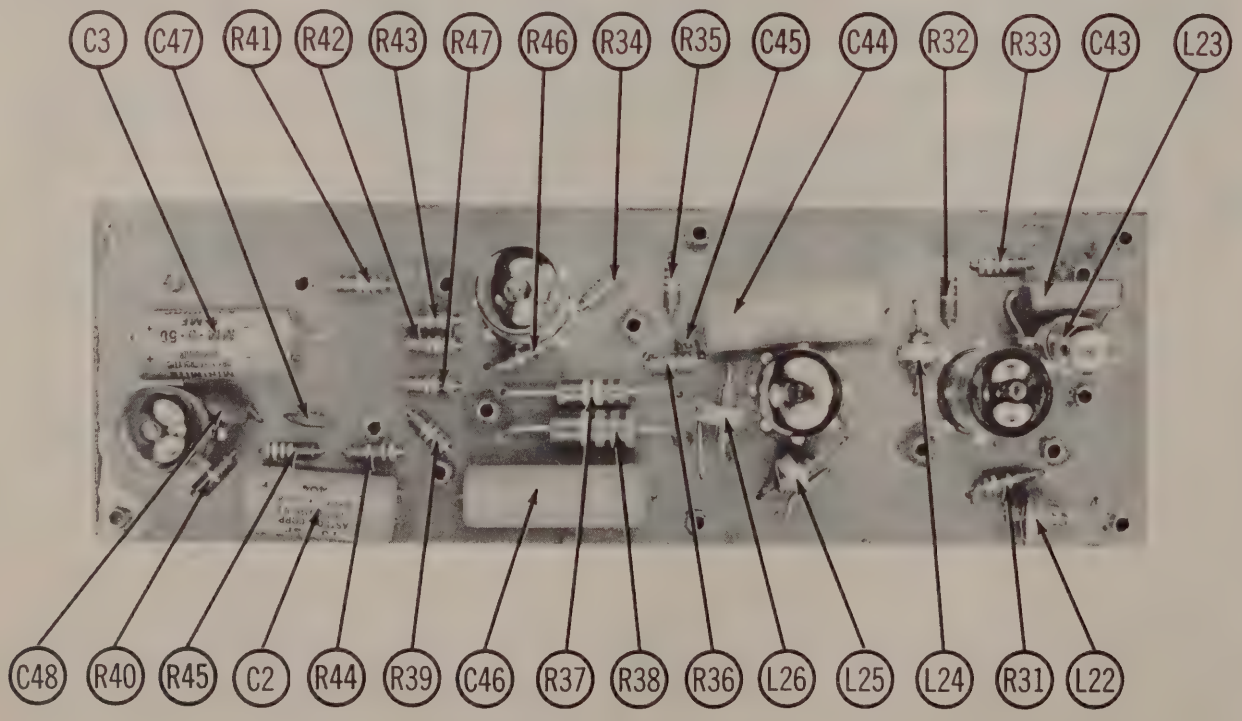
CHASSIS T-1
CHASSIS TOP VIEW



SUB-CHASSIS #1 VIDEO IF UNIT



SUB-CHASSIS #2 VIDEO OUTPUT UNIT

TUBE PLACEMENT CHART

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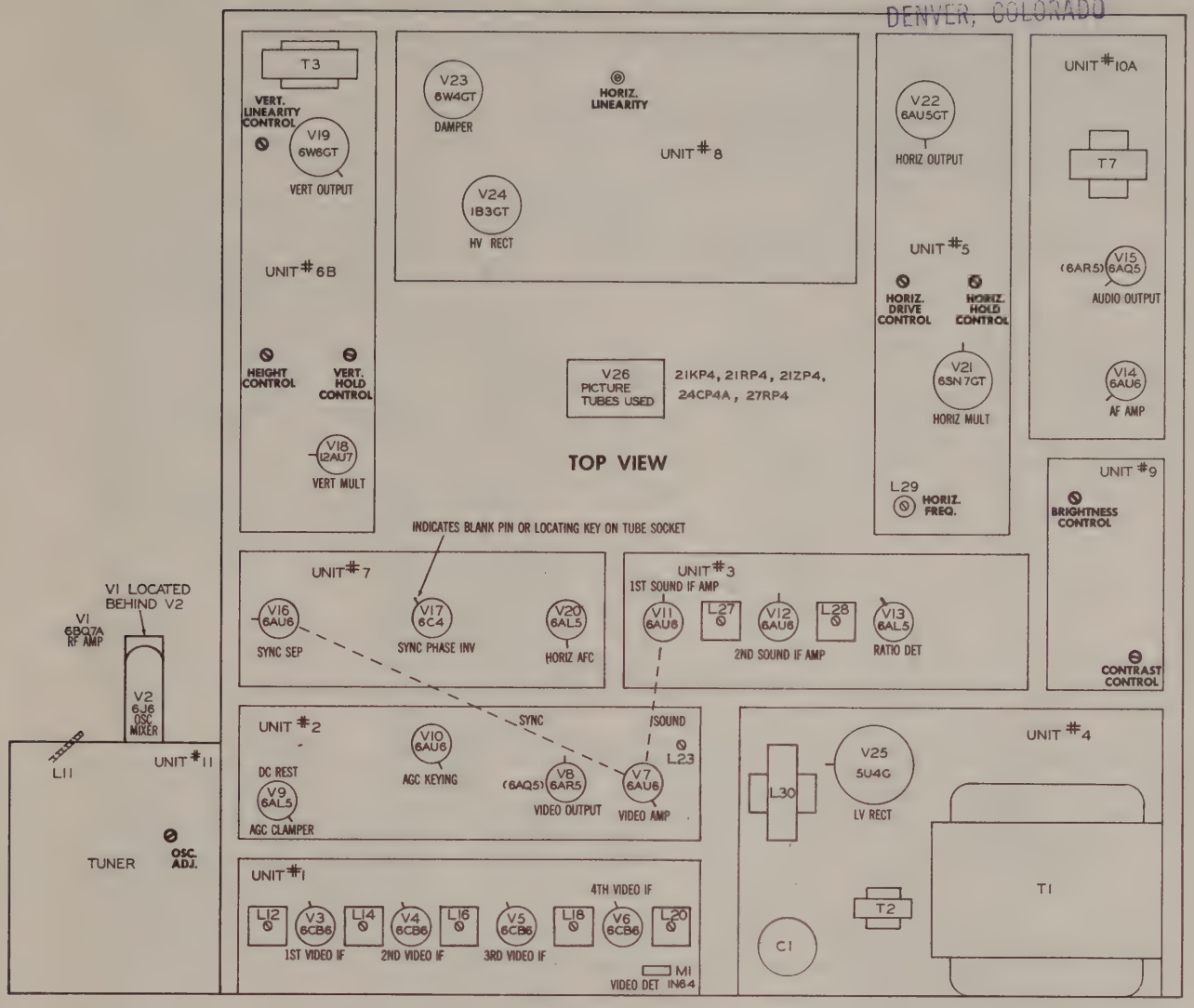

CAL-TECH CHASSIS T-1

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V25

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V8, V9, V10, V26
Has pic, no sound - V11, V12, V13, V14, V15
Overloaded picture - V10

SYNC FAILURE
No vert. sync - V17, V18
No horiz. sync - V17, V20, V21
No vert. or horiz. sync - V16, V17

SWEEP FAILURE
No raster, has sound - V21, V22, V23, V24, V26
No vertical deflection - V18, V19
Poor vert. linearity or foldover - V18, V19
Poor horiz. linearity or foldover - V21, V22, V23
Narrow picture - V21, V22, V23, V24, V25
Vert. off freq. - V17, V18
Horiz. off freq. - V17, V20, V21

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing V21 during alignment.

VIDEO IF ALIGNMENT

Connect the negative lead of a bias supply, capable of at least 6 volts supply, to the ungrounded side of C2. Positive lead to chassis.
If making a complete IF alignment start by turning slugs A1 thru A11 all the way counter clockwise. Then turn A8 and A10 three turns clockwise, A9 and A11 five turns clockwise and A2 four turns clockwise.
Use only enough sweep and marker output to provide usable indication on scope.
Connect a 470MMF capacitor from pin 1 (grid) of V4 to chassis.
Short tuner and IF AGC together with a jumper lead.
If a separate marker generator is used, connect to point (B) and chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	Across antenna terminals.	43.25MC (10MC Swp)	41.25MC	12	Vert. amp. thru detector probe (Fig. 1) to primary of L14. Low side to chassis.	A1	Remove 2nd IF tube (V4) from its socket. Set bias at -2.5 volts. Adjust A1 for minimum amplitude at 41.25MC on response curve as in Fig. 2.
2.	"	"	"	45.75MC	"	"	A2, A3	Leave bias at -2.5 volts with V4 tube removed. Adjust for response curve similar to Fig. 2. Adjust A2 for flatness of response curve and A3 for position of 45.75MC marker. Replace V4 in its socket.
3.	"	High side to point B . Low side to chassis.	Not used.	39.75MC (400∿ Mod)	"	Vert. amp. to pin 5 (plate) of 6AU6 (V7). Low side to chassis.	A4, A5	With bias set a -4 volts, adjust A4 and A5 for MINIMUM 400∿ indication on scope.
4.	"	"	"	41.25MC (400∿ Mod)	"	"	A6, A1	With bias set at -4 volts, adjust for MINIMUM 400∿ indication on scope.
5.	"	"	"	47.25MC (400∿ Mod)	"	"	A7	"
6.	"	"	"	45.25MC (400∿ Mod)	"	"	A8	With bias set at -4 volts, adjust for maximum 400∿ indication on scope.
7.	"	"	"	42.8MC (400∿ Mod)	"	"	A9	"
8.	"	"	"	45.75MC (400∿ Mod)	"	"	A10	"
9.	"	"	"	41.8MC (400∿ Mod)	"	"	A11	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 4 volt bias supply to the ungrounded side of C2. Positive lead to chassis. Short tuner and AGC together with a jumper lead.
Use only enough sweep to produce usable pattern on scope.
Remove converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	43.5MC (10MC Swp)	39.75MC 41.25MC 42.2MC 43.1MC 45.0MC 45.75MC 47.25MC	Any	Vert. amp. to point (A) . Low side to chassis.		Check for response similar to Fig. 3. If necessary, retouch A1 thru A11. SLIGHTLY readjust A10 for placement of 45.75MC marker, A9 for placement of 43.1MC marker and A8 which places the 45.0MC marker on the slope portion of the response curve. Replace V2 in its socket.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect the negative lead of a 6 volt bias supply to the ungrounded side of C2. Positive lead to chassis. This will eliminate any strong signals interfering with alignment. Use only enough signal generator output to provide accurate reading on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	4.5MC (unmod)	Any non-interfering channel.	DC probe to point (C) . Common to chassis.	A12, A13, A14	Adjust for maximum deflection.
12.	"	"	"	"	DC probe to point (D) . Common to point (C) .	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

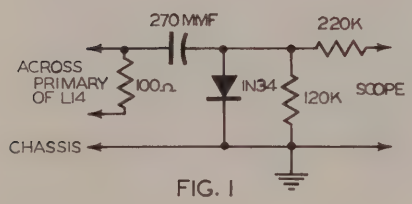

FIG. 1

FIG. 2

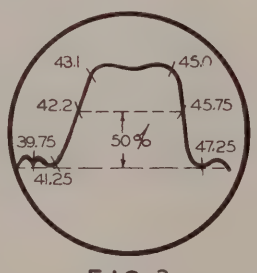

FIG. 3

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DENVER, COLORADO

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
Remove V2 from its socket.
Use only enough generator output to produce usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.01MFD	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A12, A13, A14	Disconnect stabilizing capacitor (C4). Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
12.	"	"	"	"	"	Vert. amp. thru 10KΩ to point Ⓓ. Low side to chassis.	A15	Reconnect stabilizing capacitor (C4). Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY adjust A14 for maximum amplitude and straightness of crossover lines. Replace V2 in its socket.

4.5MC TRAP ALIGNMENT

Tune in a TV station and note if 4.5MC beat pattern appears in picture. Adjust A16 for minimum 4.5MC beat in picture.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. The channel oscillator screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Connect AGC as in "Overall Video IF Response Check".

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. to point Ⓐ. Low side to chassis.	A17	Advance scope gain so that sound trap notch is visible on response curve. Adjust to place sound marker in trap notch. Video marker should fall at 50% response on opposite slope of response curve as in Fig. 6.
			213MC (10MC Swp)	211.25MC 215.75MC	13		A18	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A19	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A20	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A21	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A22	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A23	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A24	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A25	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A26	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A27	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A28	

RF AND MIXER ALIGNMENT

Connect AGC as in "Overall Video IF Response Check".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. to point Ⓑ. Low side to chassis.	A29, A30, A31	Adjust for maximum response similar to Fig. 7.
15.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 7. If markers fall below 70% on any channel, make compromise adjustments of A29, A30 and A31 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

IF TRAP ALIGNMENT

A trap is provided in the input section of the tuner for the purpose of reducing interference on channel 2 from transmitters operating in the 40MC band. If such interference is noted, adjust A32 to minimize it.

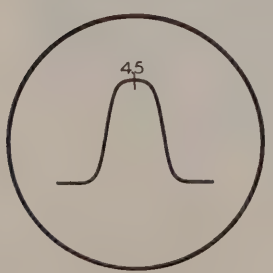


FIG. 4

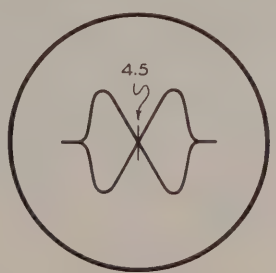


FIG. 5

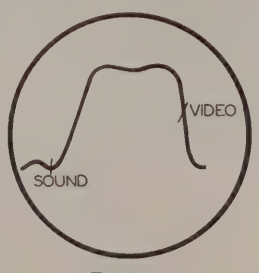


FIG. 6

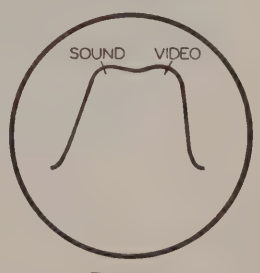
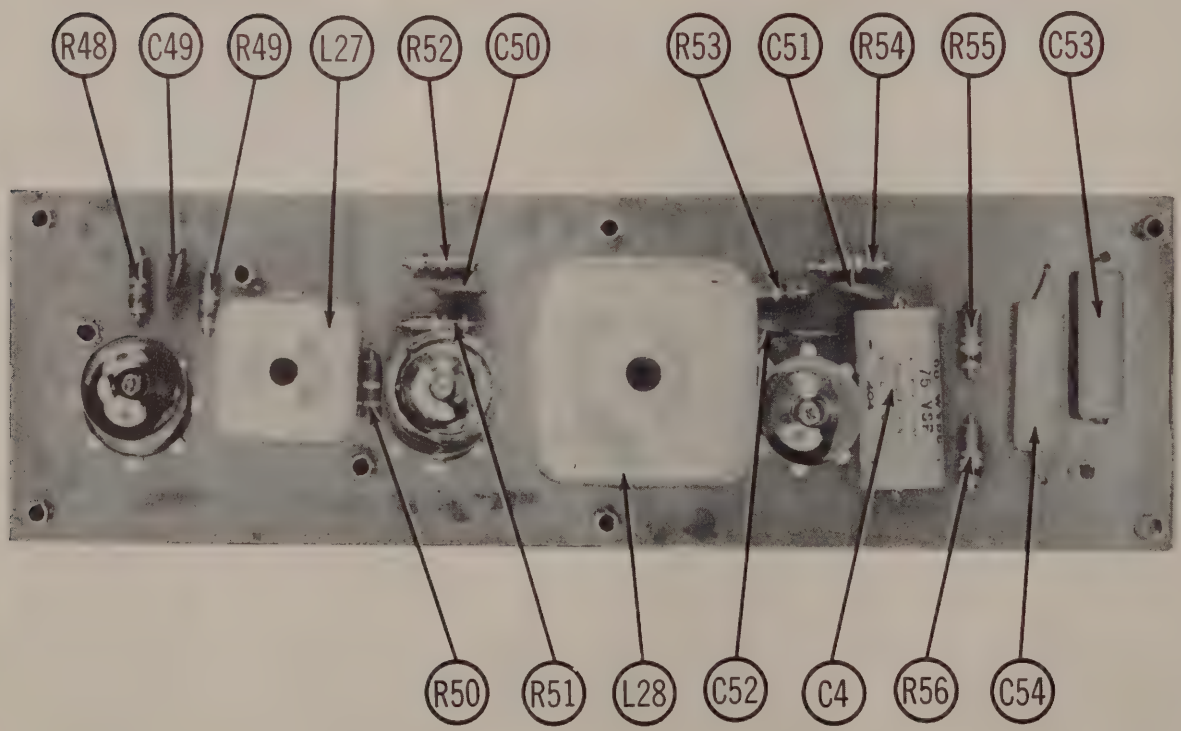


FIG. 7

RESISTANCE MEASUREMENTS

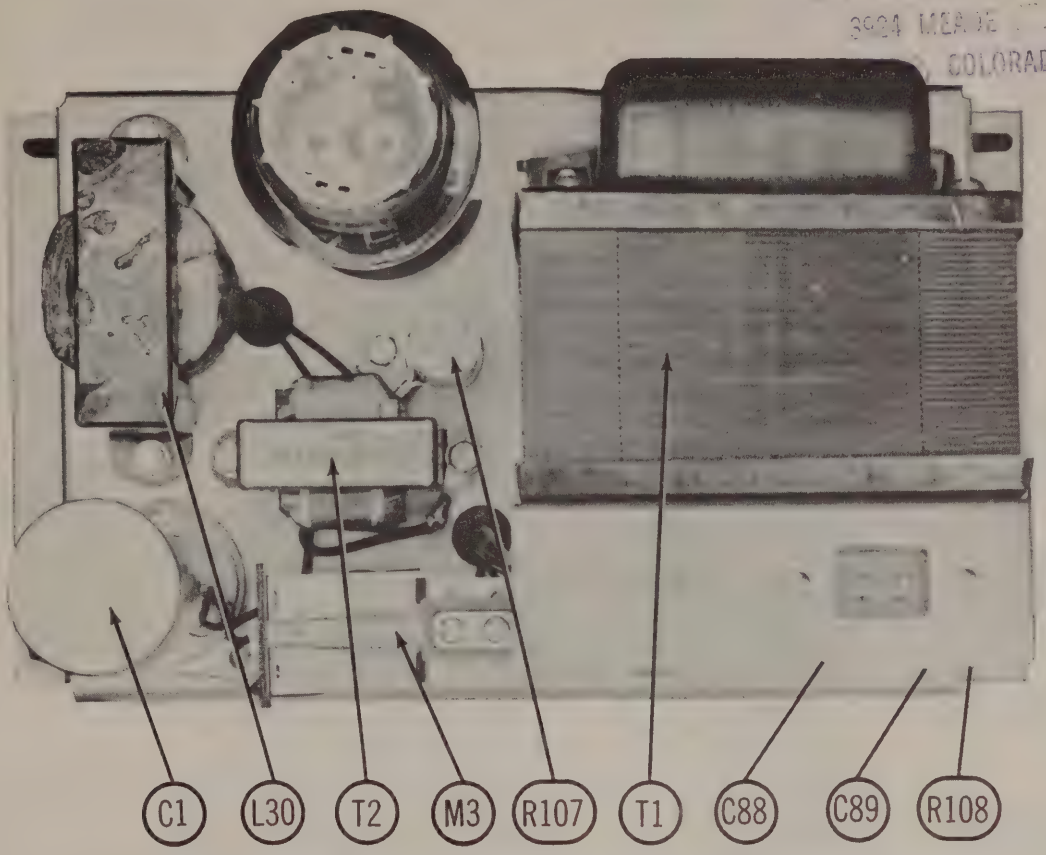
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	500KΩ	0Ω	.1Ω	0Ω	†5KΩ	220KΩ	INF	0Ω
V 2	6J6	†7KΩ	†18KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	40KΩ	47Ω	.1Ω	0Ω	†4.4KΩ	†4.4KΩ	0Ω		
V 4	6CB6	40KΩ	47Ω	.1Ω	0Ω	†4.4KΩ	†4.4KΩ	0Ω		
V 5	6CB6	.1Ω	180Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 6	6CB6	.1Ω	820Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 7	6AU6	3.9KΩ	0Ω	0Ω	.1Ω	†5.8KΩ	†2.5KΩ	.1Ω		
V 8	6AR5	470KΩ	2KΩ	.1Ω	0Ω	†5KΩ	†2.5KΩ	NC		
V 9	6AL5	1.5Meg	370KΩ	.1Ω	0Ω	0Ω	0Ω	0Ω		
V 10	6AU6	†50KΩ	†2.5KΩ	0Ω	.1Ω	150KΩ	†38Ω	†2.5KΩ		
V 11	6AU6	.1Ω	0Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	100Ω		
V 12	6AU6	2.9Ω	0Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	100Ω		
V 13	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	20KΩ		
V 14	6AU6	1Meg	0Ω	0Ω	.1Ω	†500KΩ	†1Meg	1.8KΩ		
V 15	6AQ5	500KΩ	1KΩ	.1Ω	0Ω	†1.4KΩ	†1KΩ	500KΩ		
V 16	6AU6	5Meg	0Ω	0Ω	.1Ω	†118KΩ	†35KΩ	0Ω		
V 17	6C4	†5.8KΩ	NC	.1Ω	0Ω	†5.8KΩ	470KΩ	3.4KΩ		
V 18	12AU7	▲440KΩ	560KΩ	1KΩ	0Ω	0Ω	▲1Meg	3Meg	1KΩ	.1Ω
V 19	6W6GT	TP	0Ω	†3KΩ	†3.1KΩ	1.5Meg	NC	.1Ω	1.4KΩ	
V 20	6AL5	27Ω	27Ω	0Ω	.1Ω	5Meg	0Ω	5Meg		
V 21	6SN7GT	120KΩ	†150KΩ	1.5KΩ	5Meg	†6.8KΩ	1.5KΩ	0Ω	.1Ω	
V 22	6AU5GT	470KΩ	.1Ω	180Ω	NC	▲28Ω	NC	0Ω	†8.2KΩ	
V 23	6W4GT	NC	NC	700KΩ	NC	†38Ω	NC	700KΩ	700KΩ	
V 24	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ▲442Ω
V 25	5U4G	NC	40KΩ	NC	22Ω	NC	21Ω	NC	40KΩ	
V 26	24CP4A	0Ω	1.6Meg	Pin 10 †38Ω	Pin 11 †300KΩ	Pin 12 .1Ω				

† MEASURED FROM PIN 2 OF V25.
▲ MEASURED FROM PIN 3 OF V23.
NC - NO CONNECTION

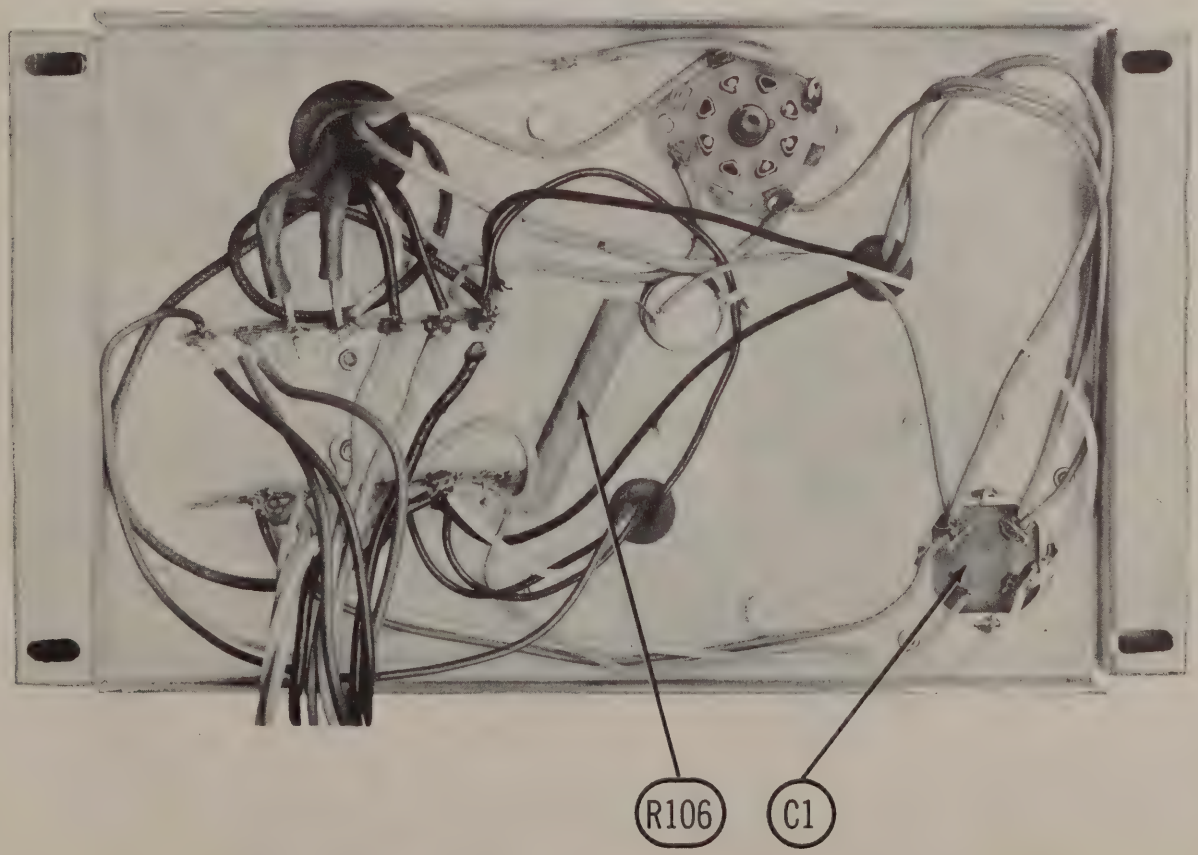


SUB-CHASSIS #3 SOUND IF UNIT

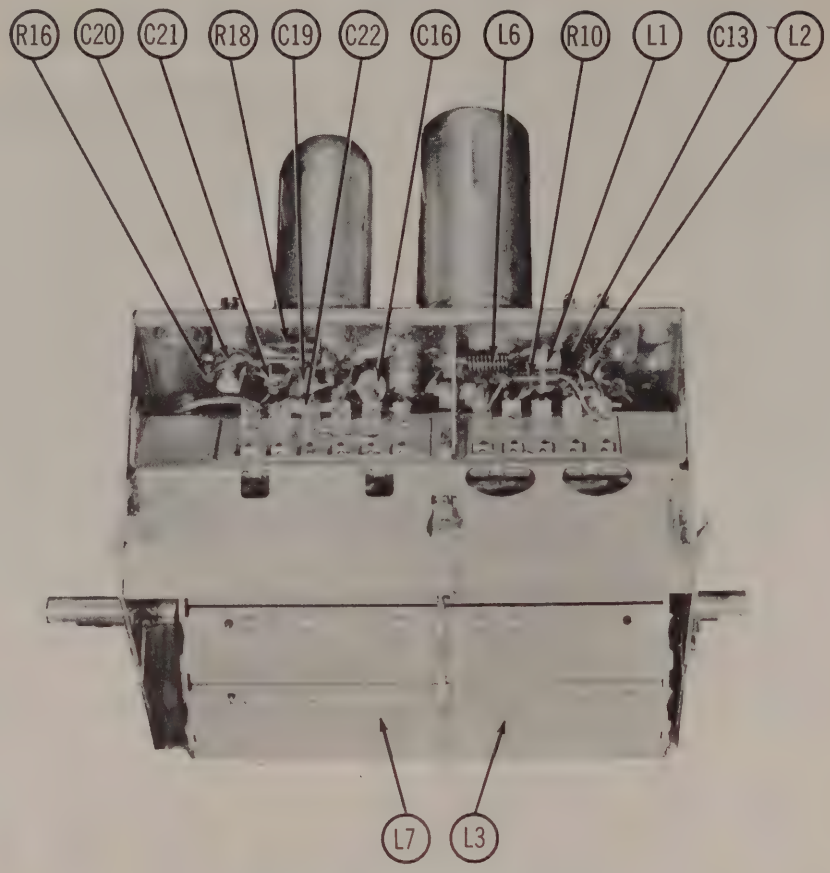
PROPERTY OF
L. F. BLANEY
3924 MEADE
COLORADO



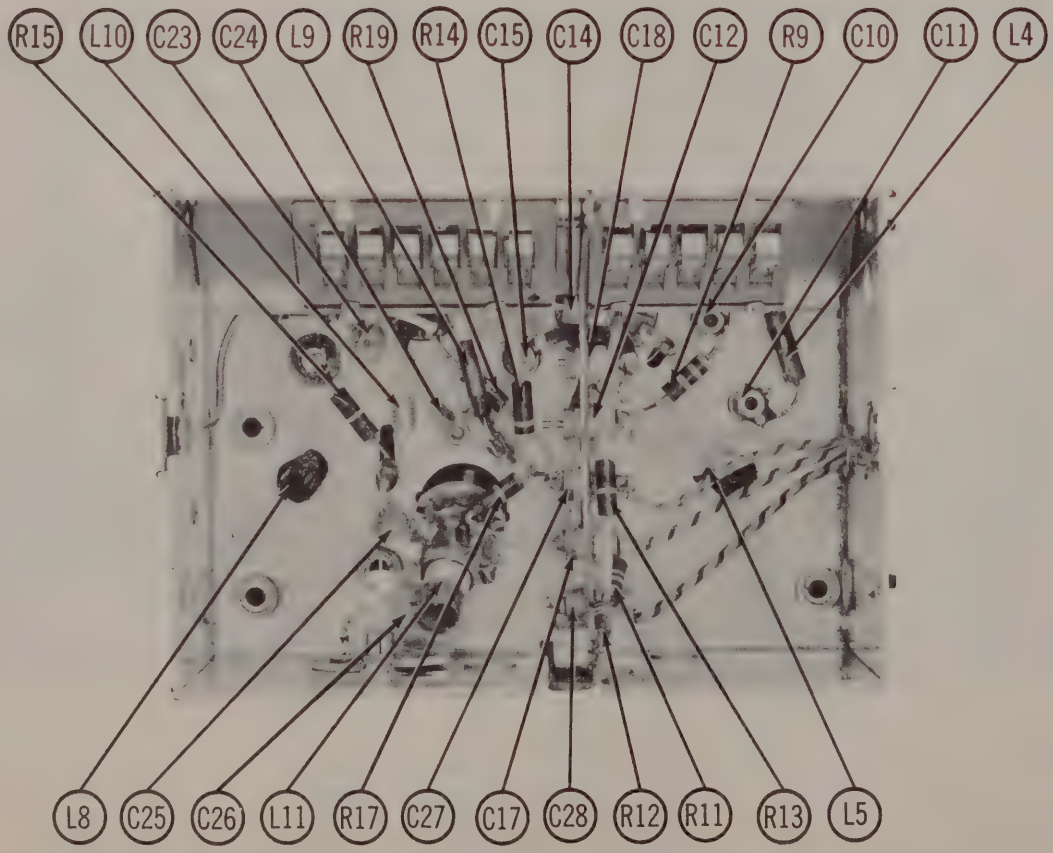
SUB-CHASSIS #4 LV POWER SUPPLY (TOP VIEW)



SUB-CHASSIS #4 LV POWER SUPPLY (BOTTOM VIEW)

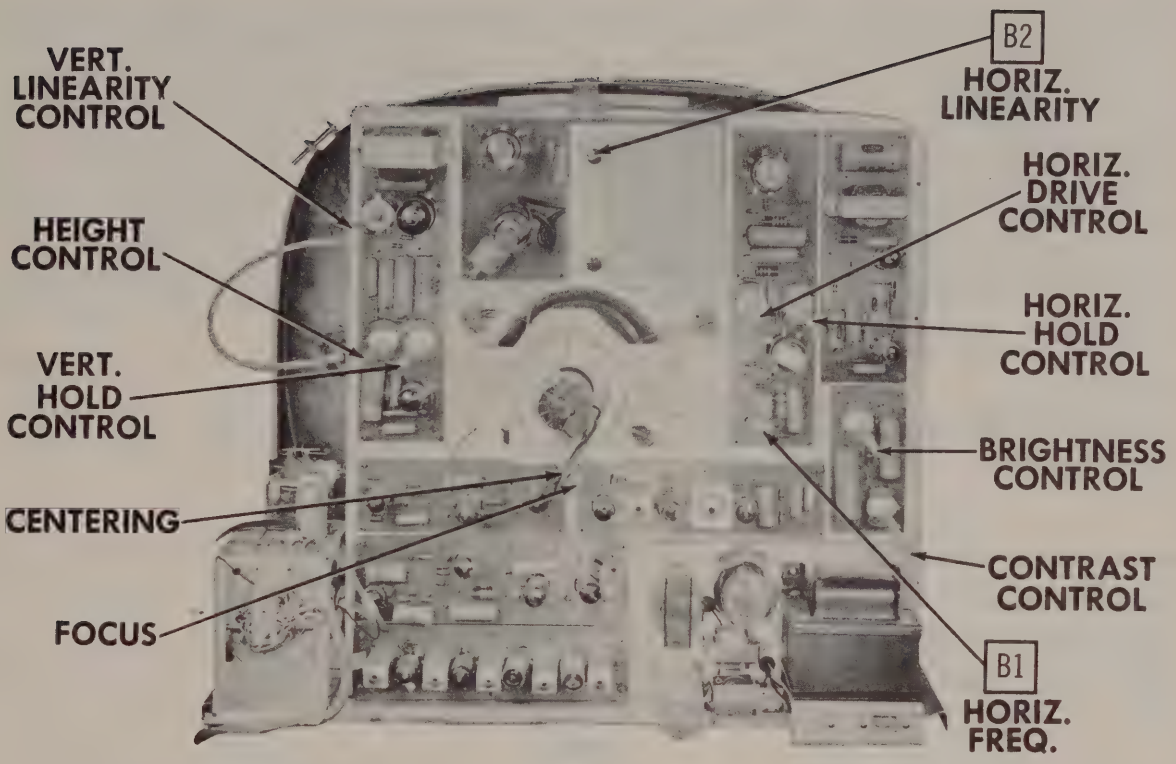


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CAL-TECH CHASSIS T-1

CHASSIS—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

1. Set the horizontal hold control (R4) to its mid-range position.
2. Adjust the horizontal oscillator coil (B1) until picture locks in horizontally.
3. Switch off channel and back again; picture should pull into sync.

Adjust the horizontal drive control (R5) clockwise until a white vertical line appears, then turn counter clockwise until white line disappears.

Adjust the horizontal linearity slug (B2) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V22, V23 and V25. Check T3, T5A, C78, C77, C81, R102, R103, R5 and other associated components.

DRIVE LINES

Check by substitution V22 and V23. Check T3, T5A, R5, R102, C78 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V22 and V23. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V21, V22 and V23. Check C75 for open. Check L29, C76, C74, R95 and other associated components.

XMAS TREE EFFECT

Check by substitution V21, V22 and V23. Check T3 and T5 for internal arcing. Check L29, C76, C71, C72, C73, C78 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V18 and V19. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R88, R84, C9 and other associated components.	Check R78, R80, R81, R77, C66, C65, C68 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V18 and V19. Check height and vertical linearity for proper operation.

COMPRESSED AT BOTTOM

Check by substitution V18 and V19. Check R81, R7, R80, C8, C65, C68 and other associated components.

COMPRESSED AT TOP

Check by substitution V18 and V19. Check R8, R84, C9, T4 and other associated components.

FOLDS

Check by substitution V18 and V19. Check R82, C67, C68 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V16 and V17. Check C60, C61, C62, R68, R69, R67, R74 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V18. Check vertical integrator network. Check R6, R79, R77, R76, C66, C65 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V20 and V21. Check C72, C73, C74, C76, L29, R95, R96, R4 and other associated components.

HORIZONTAL BENDING

Check by substitution V16, V17, V20 and V21. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V7 and V8. Check C44, C46, R32, R37, R38, L26 and other associated components.

SOUND BARS(4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A16. Check video IF Alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check C43, C44, C45, C46, L24, L25, R37, R38 and other associated components.

NEGATIVE PICTURE

Check by substitution V7 and V8. Check picture tube. Check C44, C46, R36, L22 and other associated components.

SMEAR

Check by substitution V7 and V8. Check crystal detector network. Check L21, L22, L24, L25, C44, C46 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V14 and V15, Check stages V14 and V15 using audio signal generator. Apply audio signal at point (D).

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or changes of value.	Check C54, C56, C57, C58, C59, R60, R62, R63, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A15 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or no Sound".

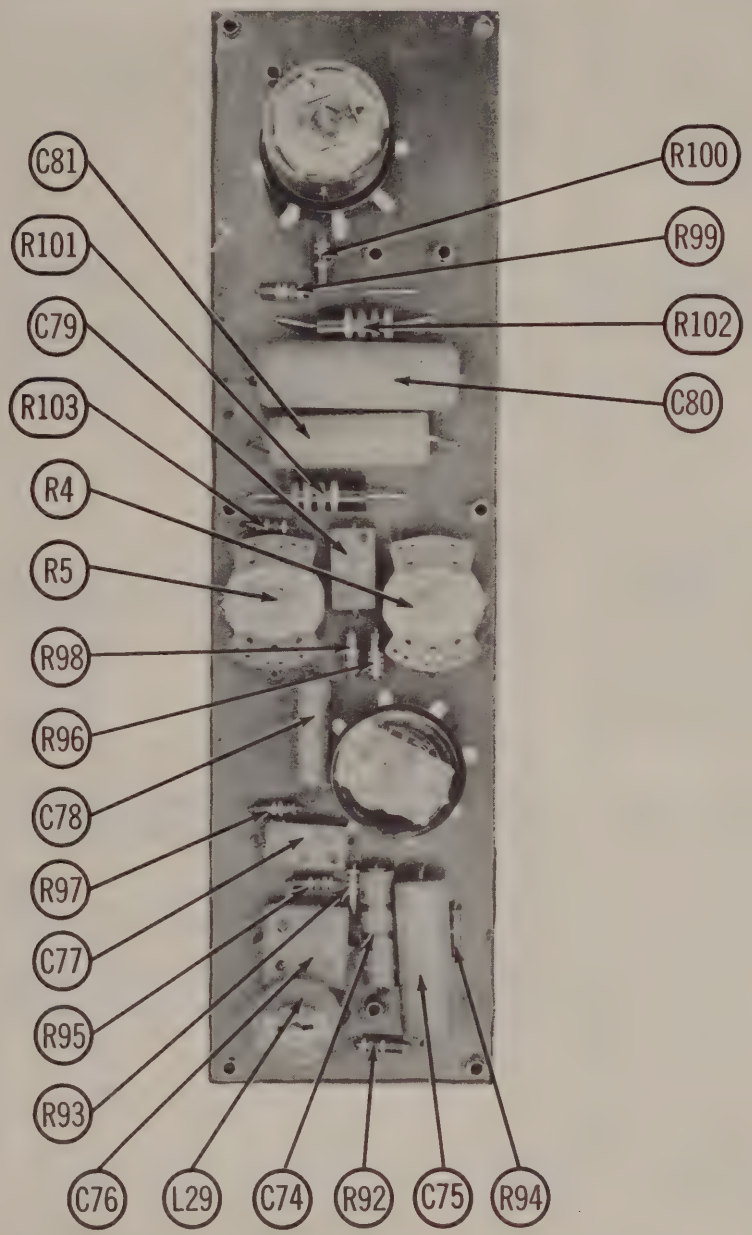
POWER

DEAD SET

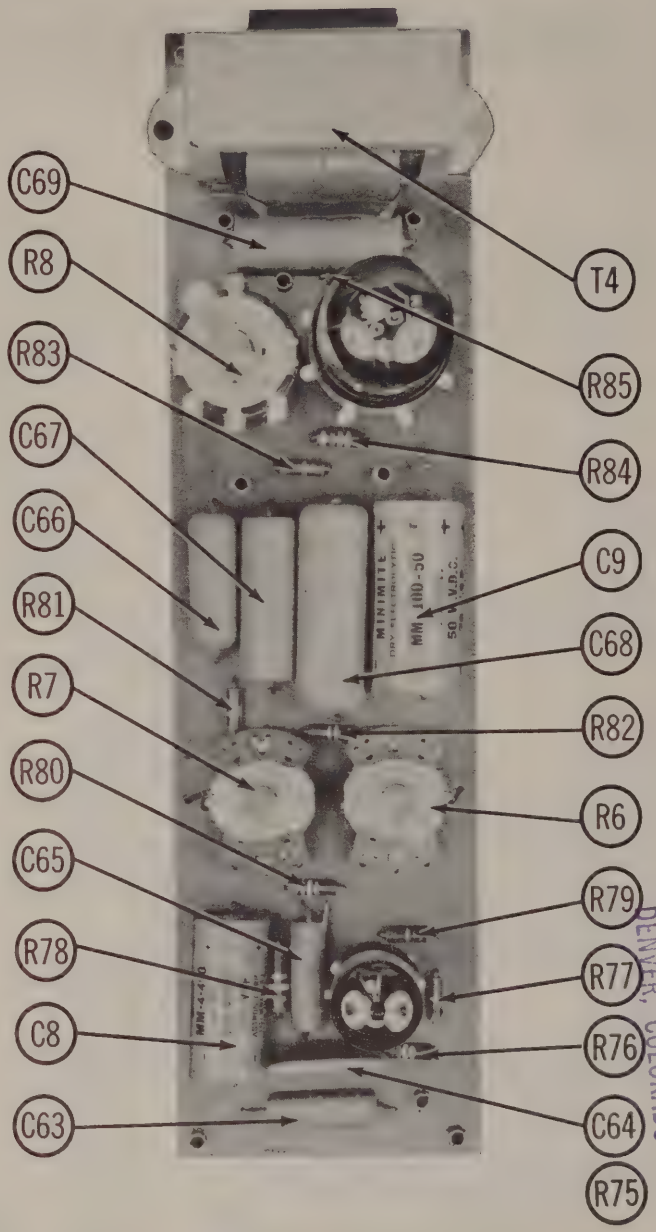
If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, substitute V25. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V25. Check B+ filter and decoupling network.



SUB-CHASSIS #5 HORIZ. OSC. UNIT



SUB-CHASSIS #6B VERTICAL UNIT

PROPERTY OF
L. F. BLANK
3924 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKEN
3224 MEADE S
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	8AJ	
V2	Osc.-Mixer	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amplifier	6AU6	6AU6	7BK	
V8	Video Output	6AR8	6CC	8AQ5 used as alternate	
V9	DC Restorer-AGC Clamper	6AL5	6AL5	6BT	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	AF Amplifier	6AU6	6AU6	7BK	
V15	Audio OuTput	6AQ5	6AQ5	7BZ	6AR5 used as alternate
V16	Sync Separator	6AU6	6AU6	7BK	
V17	Sync Phase Inv.	6C4	6C4	6BG	
V18	Vert. Mult.	12AU7	12AU7	9A	
V19	Vert. Output	6W6GT	6W6GT	7H	
V20	Horiz. AFC	6AL5	6AL5	6BT	
V21	Horiz. Mult.	6SN7GT	6SN7GT	9BD	
V22	Horiz. Output	6AU5GT	6AU5GT	6CK	
V23	Damper	6W4GT	6W4GT	4CG	
V24	HV Rectifier	1B3GT	1B3GT	3C	
V25	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Cal-Tech PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V26	24CP4A ① ② 27RP4 ④	24CP4A ① 27RP4	24CP4A ① 27RP4	24CP4A ④ 24CP4 27EP4/ 27TP4	24CP4A ①	12N 12N 12N 12N	① Aluminized ② These tubes are recommended by Mfg. ③ Circuit changes necessary ④ Silver Screen
	21RP4 ④ 21KP4 ④ 21EP4 ④			21EP4 ④	21EP4 ④	12D	
		21ZP4A 21ZP4B ①	21ZP4A 21ZP4B ①	21ZP4A 21ZP4B ④	21ZP4A 21ZP4B ①	12N 12N	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: PYRAMID PART No.	REPLACEMENT DATA: SANGAMO PART No.	NOTES
C1A	ø40	400				FP378	TM-804020-450	Q-251	
B	ø30	400				TC78		MT-4830	
C	ø40	350					TD-40-350		
D	20	350							
C2	5	50			TC30	TD-5-50	MMT-0505		
C3	5	50			TC30	TD-5-50	MMT-0505		
C4	5	50			TC30	TD-5-50	MMT-0505		
C5	5	50			TC30	TD-5-50	MMT-0505		
C6	20	350			TC55	TD-20-350	FM-4520		
C7	25	50			TC56	TD-25-50	FM-0525		
C8	4	450			TC70	TD-4-450	FM-4504		
C9	100	50			TC3901	TD-100-50	MTH-5010		
C10	3-9			829-10					
C11	3-9			829-10					
C12	1000								
C13	3			TCZ-3	NP0A-030	ZT-5S33			
C14	1000								
C15	.5-3			829-3	311S-01-GR5	CT505A			
C16	120			D6-121	811-121	UC-5312			
C17	1000								
C18	1000								
C19	51			D6-510	831-510	UC-546			
C20	.5-3			829-3	311S-01-GR5	CT505A			
C21	10			TCZ-10	NP0K-100	ZT-541			
C22	5								
C23	1500			DD-152	801-0015	DC-5315			
C24	1500			DD-152	801-0015	DC-5315			
C25	6 8			TCZ-6.8	NP0K-080	ZT-5566			
C26	56			D6-560	831-560	UC-5656			
C27	1000								
C28	1000								
C29	1500			DD-152	801-0015	DC-5218			
C30	1000			DD-102	801-001	DC-521		K-1310	
C31	470			DD-471	831-471	UC-5347		K-1347	
C32	1000			DD-102	801-001	DC-521		K-1310	
C33	1000			DD-102	801-001	DC-521		K-1310	
C34	470			DD-471	831-471	UC-5347		K-1347	
C35	1000			DD-102	801-001	DC-521		K-1310	
C36	470			DD-471	831-471	UC-5347		K-1347	
C37	1000			DD-102	801-001	DC-521		K-1310	
C38	1000			DD-102	801-001	DC-521		K-1310	
C39	470			DD-471	831-471	UC-5347		K-1347	
C40	1000			DD-102	801-001	DC-521		K-1310	
C41	1000			DD-102	801-001	DC-521		K-1310	
C42	5			TCZ-5	NP0A-050	ZT-555			
C43	1000	500				MCE3255		KM-1310	
C44	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C45	1000			DD-102	801-001	DC-521		K-1310	
C46	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C47	5000			DD-502	811-005	DC-535		C-1350	
C48	5000			DD-502	811-005	DC-535		C-1350	
C49	5000			DD-502	811-005	DC-535		C-1350	
C50	5000			DD-502	811-005	DC-525		C-1250	
C51	5000			DD-502	811-005	DC-535		C-1250	
C52	1000			DD-102	801-001	DC-521		K-1210	
C53	.003	600		D6-302	GP2-333-302	PT6313	IMP6-D3	330623	
C54	.022	200		DF-203	817-02	PT4122	IMP4-S23	3304123	
C55	5000			DD-502	811-005	DC-535		C-1250	Note 1
C56	.022	200		DF-203	817-03	PT4122	IMP4-S23	3304123	
C57	.1	400		DF-104		PT401	IMP4-P1	330401	
C58A	5000								
B				†PC-70	†1406-01				
C	250								
C59	.005	400		D6-502	GP2-333-502	PT6315	IMP6-D5	330625	
C60	.0047	600		D6-472	GP2-333-472	PT6347	IMP6-D47	3306347	
C61	.270			D6-271	GP2E-271	DC-5327		K-1327	
C62	.047	400		DF-503		PT4147	IMP4-S47	3304147	
C63	.0047	600		D6-472	GP2-333-472	PT6347	IMP6-D47	3306347	
C64A	3000					DC-5329	IMP6-D6	C-1330	
B	5000				s1406-01	DC-525	IMP6-D5	C-1250	
C	5000					DC-529	IMP6-D6	C-1250	
C65	.004	600		D6-402	GP2-333-402	PT6324	IMP6-D4	330624	
C66	.047	400		DF-503		PT4147	IMP4-S47	3304147	
C67	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C68	.1	600		DF-104		PT601	IMP6-P1	330601	
C69	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C70	.22	400				PT4222	IMP4-P22	3304222	
C71	.22	600				PT6222	IMP6-P22	3306222	
C72	.1000			D6-102	GP2L-103	UC-531	IMP6-D1	K-1210	
C73	1000			D6-102	GP2L-103	UC-521	IMP6-D1	K-1210	
C74	.01	400		D6-103	GP2-333-103	PT4IL	IMP4-S1	330411	
C75	.047	600		DF-503		PT6147	IMP6-S47	3306147	
C76	4000	500				MCE4G3		CE-1340	
C77	500	500				MCE3545		KM-1350	
C78	.002	600		D6-202	GP2-333-202	PT6232	IMP6-D3	330622	
C79	330	500						KM-1333	
C80	.22	400				PT4222	IMP4-P22	3304222	
C81	.22	200				PT4222	IMP4-P22	3302222	
C82	.02	600				PT623	IMP6-S3	330613	
C83	56	2000		DD-30-560	2KV-560	MCL4G6		K-4456	
C84	.039	400							Note 1
C85	500	20000		TV3-502	413	HV20035A			
C86	56	2000		DD-30-560	3KV-560	MCL4G6		K-4456	
C87	82	3000		DD-30-820		MCL4G3		K-4483	
C88	.0047	400		D6-472	GP2-333-472	PT6347	IMP6-D47	3306347	
C89	.0047	400		D6-472	GP3-333-472	PT6347	IMP6-D47	3306347	
C90	.1	400		DF-104		PT401	IMP4-P1	330401	

Note 1: Not used in some versions.
† Items C58A, C58B, C58C, R61A, and R61B are combined in one unit.
When replacing items separately C58B and C58C should total 3500MMF.
◆ Items C64A, C64B, C64C, R75A, R75B and R75C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	1	CM13974			AB7-5Ω		Volume tapped at 50Ω
B	Shaft		Not Req.			AK-3		Attach to 41A
C	Switch		Not Req.			KS-1		Attach to 41A
R2	5000Ω	½	BA01-1388					Contrast
R3	500Ω	½	BA01-1387					Brightness
R4	100Ω	½	BA01-1390					Horiz. Hold - Note
R5	1000Ω	½	BA01-1389					Horiz. Drive
R6	3Meg	½	BA01-1385					Vert. Hold
R7	500Ω	½	BA01-1387					Height
R8	1000Ω	2						Vert. Linearity (Wire wound)

Note: Not used in some versions.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R9	47KΩ	½		BTS-47K	
R10	15KΩ	½		BTS-15K	
R11	180KΩ	½		BTS-180K	
R12	270KΩ	½		BTS-270K	
R13	100KΩ	½		BTS-100K	
R14	470Ω	½		BTS-470	
R15	220KΩ	½		BTS-220K	
R16	1MEG	½		BTS-1Meg	
R17	15KΩ	½		BTS-15K	
R18	10KΩ	½		BTS-10K	
R19	470Ω	½		BTS-470	
R20	4700Ω	3		BTB-4700	
R21	470Ω	½		BTS-470	
R22	47Ω	½		BTS-47	
R23	1800Ω	½		BTS-1800	
R24	470Ω	½		BTS-470	
R25	47Ω	½		BTS-47	
R26	1800Ω	½		BTS-1800	
R27	180Ω	½		BTS-180	
R28	1000Ω	½		BTS-1000	
R29	330Ω	½		BTS-330	
R30	1000Ω	½		BTS-1000	
R31	3900Ω	½		BTS-3900	
R32	3300Ω	½		BTS-3300	
R33	39KΩ	½		BTS-39K	
R34	47KΩ	½		BTS-47K	
R35	470KΩ	½		BTS-470K	
R36	470Ω	½		BTS-470	
R37	12KΩ	1		BTA-12K	
R38	8200Ω	8		BTB-8200	
R39	68KΩ	½		BTS-68K	
R40	1.5Meg	½		BTS-1.5Meg	
R41	180KΩ	½		BTS-180K	
R42	270KΩ 5%	½		BTS-270K 5%	
R43	5.6Meg 5%	½		BTS-5.6Meg 5%	
R44	3300Ω	½		BTS-3300	
R45	39KΩ	½		BTS-39K	
R46	1Meg	½		BTS-1Meg	
R47	100KΩ	½		BTS-100K	
R48	100Ω	½		BTS-100	
R49	1000Ω	½		BTS-1000	
R50	5600Ω	½		BTS-5600	
R51	100Ω	½		BTS-100	
R52	1000Ω	½		BTS-1000	
R53	82Ω	½		BTS-82	
R54	22KΩ	½		BTS-22K	
R55	10KΩ	½		BTS-10K	
R56	10KΩ	½		BTS-10K	
R57	1Meg	½		BTS-1Meg	
R58	1800Ω	½		BTS-1800	
R59	39Ω	½		BTS-39	
R60	1Meg	½		BTS-1Meg	
R61A	500KΩ	½	†	BTS-470K	
B	500KΩ	½	†	BTS-470K	
R62	1000Ω	1		BTA-1000	
R63	470Ω	½		BTS-470	
R64	100Ω	½		BTS-100	
R65	4.7Meg	½		BTS-4.7Meg	
R66	470KΩ	½		BTS-470K	
R67	27KΩ	½		BTS-27K	
R68	100KΩ	½		BTS-100K	

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R69	18KΩ	½		BTS-18K	
R70	5600Ω	½		BTS-5600	
R71	470KΩ	½		BTS-470K	
R72	2700Ω 5%	½		BTS-2700 5%	
R73	680Ω	½		BTS-680	
R74	3300Ω	½		BTS-3300	
R75A	27KΩ	½		BTS-27K	
B	8200Ω	½	◆	BTS-8200	
C	8200Ω	½		BTS-8200	
R76	560KΩ	½		BTS-560K	
R77	1000Ω	½		BTS-1000	
R78	180KΩ	½		BTA-180K	
R79	1.5Meg	½		BTS-1.5Meg	
R80	680KΩ	½		BTS-680K	
R81	150KΩ	½		BTS-150K	
R82	10KΩ	½		BTS-10K	
R83	1.5Meg	½		BTS-1.5Meg	
R84	680Ω	½		BTS-680	
R85	120Ω	½		BTS-120	
R86	560Ω	½		BTS-560	
R87	680Ω	½		BTS-680	
R88	2Ω	1			
R89	220KΩ	½		BTS-220K	
R90	100KΩ 5%	½		BTS-100K 5%	
R91	100KΩ 5%	½		BTS-100K 5%	
R92	4.7Meg	½		BTS-4.7Meg	
R93	470KΩ	½		BTS-470K	
R94	1500Ω	½		BTS-1500	
R95	6800Ω	½		BTS-6800	
R96	68KΩ	½		BTS-68K	Note 1
R97	150KΩ	½		BTS-150K	
R98	5600Ω	½		BTS-5600	
R99	470KΩ	½		BTS-470K	
R100	47Ω	½		BTS-47	
R101	180Ω	3			Note 2
R102	6800Ω	3		BTB-6800	
R103	680Ω	½		BTS-680	Note 3
R104	3.3Ω	1			
R105	1000Ω	8		BTS-1000	
R106	2700Ω	8			
R107	2500Ω	20			
R108	220KΩ	½		BTS-220K	
R109	47KΩ	½		BTS-47K	Note 2

† Items R6A, R6B, C58A, C58B and C58C are combined in one unit.
◆ Items R75A, R75B, R75C, C64A, C64B and C64C are combined in one unit.
Note 1: In some versions, a 180KΩ resistor is used in place of R4 and R96.
Note 2: Some versions use a 100Ω 2 watt resistor in this application.
Note 3: Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: Halldorson PART No.	REPLACEMENT DATA: Merit PART No.	REPLACEMENT DATA: RCA TYPE No.	REPLACEMENT DATA: Stancor PART No.	REPLACEMENT DATA: Thordarson PART No.	REPLACEMENT DATA: Triad PART No.
T1	117VAC	620VCT @ 1.78A	5VAC @ 3A							
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @ 2A	6.3VAC @ 9.7A								

TRANSFORMER (RELAY POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: Halldorson PART No.	REPLACEMENT DATA: Merit PART No.	REPLACEMENT DATA: RCA TYPE No.	REPLACEMENT DATA: Stancor PART No.	REPLACEMENT DATA: Thordarson PART No.	REPLACEMENT DATA: Triad PART No.
T2	117VAC @ .05A	6.3VCT @ .3A			P9100 ①	P-3046 ②		PS-8415 ③	TLP28 ①	F-13X

① Tape 5, 3V center tap.
② Tape HV winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: Halldorson PART No.	REPLACEMENT DATA: Merit PART No.	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: Rem PART No.	REPLACEMENT DATA: Stancor TYPE No.	REPLACEMENT DATA: Thordarson PART No.	REPLACEMENT DATA: Triad PART No.
T3	Horiz. Output Trans.	CT-102 ①							
T4	Vert. Output Trans.		21802 ②	A-3038 ②		V305 ②	A-8143 ②	26853 ②	A-96X ②
T5A	Yoke(90°) Horiz. (19MH)	CT-103		DF-807 ②			DY-16A ②	Y-16 ②	Y-41-1 ②
B	Vert. (40MH)								
T6	Horiz. Lin. Coil								
	@ 1-4.5MH)	②		MWC-5	209R1	20IR5A	WC-6	WC-7	WC-12
T7	Width Coil (3.9-2.2MH)	②	RF800 ②	MWC-1 ②	215R1	20JR10	WC-5 ②	WC-20 ②	WC-11 ②

① Trans. only. Also available as part of strip #8; horiz. output.
② Trans. only. Also available as part of strip #6B; vertical sweep.
③ Use original mounting frame.
④ Use original yoke damping network.
⑤ Connect horiz. damping network across terminals #3 and #7. Use original network, if necessary.
⑥ Not used in some versions.
⑦ Connect to terminals #4 and #2.
⑧ Connect to terminals #3 and #4.
⑨ Conndct to coded red and blue terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: Halldorson PART No.	REPLACEMENT DATA: Merit PART No.	REPLACEMENT DATA: Stancor PART No.	REPLACEMENT DATA: Thordarson PART No.	REPLACEMENT DATA: Triad PART No.	NOTES
T8	4.5KΩ	3Ω to 4Ω		Z1010 ①	A-3019 ①	A-3853 ①	26548 ①	S-5X ①	① Fabricate new mounting.

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI	DC RES.: SEC	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: MILLER PART No.	NOTES
L1	IF Trap	0Ω						Wound on Cap.
L2	IF Trap	0Ω						Wound on Cap.
L3	Ant. Coils	0Ω						
L4	IF Trap	.9Ω						
L5	Fil. Choke	0Ω						
L6	Neut. Coil	0Ω						
L7	RF, Mixer Grid & Osc. Coil	0Ω						
L8	Fil. Choke	0Ω						
L9	Feedback Coil	1.4Ω						
L10	RF Coil	0Ω						
L11	Conv. Plate	0Ω						
L12	Ist. Video IF	.1Ω		D6U				Includes 41.25MC trap, 3.3KΩ resistor

CAL-TECH CHASSIS T-1

PROPERTY OF
L. F. CLARKSON
3241 MEADE
DENVER, COLORADO

CRIPTIONS
(nt)

	PYRAMID PART No.	SANGAMO PART No.	NOTES
		C-1250	
		C-1250	
		K-1210	
	IMP6-D3	330623	
	IMP4-S22	3304122	
		C-1250	Note 1
	IMP4-S22	3304122	
	IMP4-P1	330401	
	IMP6-D5	330625	
	IMP6-D47	3306247	
		K-1327	
	IMP4-S47	3304147	
	IMP6-D47	3306247	
	IMP6-D2	C-1220	
	IMP6-D5	C-1250	
	IMP6-D5	C-1250	
	IMP6-D4	330624	
	IMP4-S47	3304147	
	IMP6-S47	3306147	
	IMP6-P1	330601	
	IMP6-S47	3306147	
	IMP4-P22	3304022	
	IMP6-P22	3306022	
	IMP6-D1	K-1210	
	IMP6-D1	K-1210	
	IMP4-S1	330411	
	IMP6-S47	3306147	
		CR-1240	
		KR-1350	
	IMP6-D2	330622	
		KR-1333	
	IMP4-P22	3304022	
	IMP2-P22	3302022	
	IMP6-S3	330613	
		K-4456	
			Note 1
		K-4456	
		K-4482	
	IMP6-D47	3306247	
	IMP6-D47	3306247	
	IMP4-P1	330401	

it.

AB	MALLORY PART No.	INSTALLATION NOTES
		Volume tapped at 50KΩ
		Attach to R1A
		Attach to R1A
		Contrast
		Brightness
		Horiz. Hold - Note
		Horiz. Drive
		Vert. Hold
		Height
		Vert. Linearity (Wire wound)

ATING		REPLACEMENT DATA		NOTES
MS	WATT	Cal-Tech PART No.	IRC PART No.	
teg	½		BTS-1. 5Meg	
Ω	½		BTS-180K	
Ω 5%	½		BTS-470K 5%	
teg	½		BTS-5. 6Meg 5%	
Ω	½		BTS-3300	
	½		BTS-39K	
	½		BTS-1Meg	
Ω	½		BTS-100K	
	½		BTS-100	
Ω	½		BTS-1000	
Ω	½		BTS-5600	
	½		BTS-100	
Ω	½		BTS-1000	
	½		BTS-82	
	½		BTS-22K	
	½		BTS-10K	
	½		BTS-10K	
	½		BTS-1Meg	
Ω	½		BTS-1800	
	½		BTS-39	
	½		BTS-1Meg	
Ω	½	†	BTS-470K	
Ω	½		BTS-470K	
Ω	1		BTA-1000	
Ω	1		BTA-1000	
Ω	½		BTS-1000	
teg	½		BTS-4. 7Meg	
Ω	½		BTS-470K	
	½		BTS-27K	
Ω	½		BTS-100K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Cal-Tech PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R69	18KΩ	½		BTS-18K	
R70	5600Ω	½		BTS-5600	
R71	470KΩ	½		BTS-470K	
R72	2700Ω 5%	½		BTS-2700 5%	
R73	680Ω	½		BTS-680	
R74	3300Ω	½		BTS-3300	
R75A	27KΩ	½		BTS-27K	
B	8200Ω	½	♦	BTS-8200	
C	8200Ω	½		BTS-8200	
R76	560KΩ	½		BTS-560K	
R77	1000Ω	½		BTS-1000	
R78	180KΩ	1		BTA-180K	
R79	1. 2Meg	½		BTS-1. 2Meg	
R80	680KΩ	½		BTS-680K	
R81	150KΩ	½		BTS-150K	
R82	10KΩ	½		BTS-10K	
R83	1. 5Meg	½		BTS-1. 5Meg	
R84	680Ω	½		BTS-680	
R85	120Ω	½		BTS-120	
R86	560Ω	½		BTS-560	
R87	560Ω	½		BTS-560	
R88	27Ω	1			

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Cal-Tech PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R89	220KΩ	½		BTS-220K	
R90	100KΩ 5%	½		BTS-100K 5%	
R91	100KΩ 5%	½		BTS-100K 5%	
R92	4. 7Meg	½		BTS-4. 7Meg	
R93	470KΩ	½		BTS-470K	
R94	1500Ω	½		BTS-1500	
R95	6800Ω	½		BTS-6800	
R96	68KΩ	½		BTS-68K	Note 1
R97	150KΩ	½		BTS-150K	
R98	5600Ω	½		BTS-5600	
R99	470KΩ	½		BTS-470K	
R100	47Ω	½		BTS-47	
R101	180Ω	2			Note 2
R102	8200Ω	2		BTB-8200	
R103	680Ω	½		BTS-680	Note 3
R104	3. 3Ω	1			
R105	1000Ω	½		BTS-1000	
R106	2700Ω	5			
R107	2500Ω	2			
R108	220KΩ	½		BTS-220K	
R109	47KΩ	½		BTS-47K	Note 3

† Items R61A, R61B, C58A, C58B and C58C are combined in one unit.
♦ Items R75A, R75B, R75C, C64A, C64B and C64C are combined in one unit.
Note 1: In some versions, a 120KΩ resistor is used in place of R4 and R96.
Note 2: Some versions use a 100Ω 2 watt resistor in this application.
Note 3: Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Cal-Tech PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	620VCT	5VAC							
	ⓟ1. 76A	. 230ADC	ⓟ 3A							
	SEC. 3	SEC. 4	SEC. 5							
	6. 3VAC	6. 3VAC								
	ⓟ1. 2A	ⓟ8. 7A								

TRANSFORMER (RELAY POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Cal-Tech PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117VAC	6. 3VCT			P9100 ②	P-3046②		PS-8415②	21F08 ①	F-13X
	ⓟ. 05A	ⓟ. 31A								

① Tape 6. 3V center tap.
② Tape HV winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	Cal-Tech PART No.	Halldorson PART No.	Merit PART No.	RCA PART No.	Ram PART No.	Stancor TYPE No.	Thordarson PART No.	Triad PART No.
T3	Horiz. Output Trans.	CT-102 ①							
T4	Vert. Output Trans.	②	Z1802③	A-3038③		V305③	A-8143③	26S53③	A-99X③
T5A	Yoke(90°)Horiz. (19MH)	CT-103	DF-607④				DY-16A⑤	Y-16⑤	Y-41-1⑤
B	Vert. (40MH)								
T6	Horiz.Lin.Coil (1.1-4. 5MH)	⑥		MWC-5	209R1	201R5A	WC-6	WC-17	WC-12
T7	Width Coil (3.9-21.2MH)	⑥	RF800⑦	MWC-1⑨	215R1	201R10	WC-5⑨	WC-20⑧	WC-11⑨

① Trans. only. Also available as part of strip #8;horiz. output.
② Trans. only. Also available as part of strip #6B; vertical sweep.
③ Use original mounting frame.
④ Use original yoke damping network.
⑤ Connect horiz. damping network across terminals #3 and #7. Use original network, if necessary.
⑥ Not used in some versions.
⑦ Connect to terminals #1 and #2.
⑧ Connect to terminals #3 and #4.
⑨ Connect to coded red and blue terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Cal-Tech PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T8	4. 8KΩ	3Ω to 4Ω		Z1010 ①	A-3019 ①	A-3852 ①	26S49 ①	S-5Z ①	① Fabricate new mounting.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Cal-Tech PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω						Wound on Cap.
L2	IF Trap	0Ω						Wound on Cap.
L3	Ant. Coils	0Ω						
L4	IF Trap	.9Ω						
L5	Fil. Choke	0Ω						
L6	Neut.Coil	0Ω						
L7	RF, Mixer Grid & Osc. Coil	0Ω						
L8	Fil. Choke	0Ω						
L9	Feedback Coil	1.4Ω						
L10	RF Coil	0Ω						
L11	Conv. Plate	0Ω						
L12	1st. Video IF	.1Ω		D311				Includes 41.25MC trap , 3.3KΩ resistor

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Cal-Tech PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L13 L14	Fil. Choke 2nd. Video IF	0Ω .1Ω	.1Ω	D312			6232 *	Includes 39.75MC trap, 8.2KΩ resistor
L15 L16	Fil. Choke 3rd. Video IF	0Ω .1Ω	.1Ω	D313			6233 *	Includes 47.25MC trap, 8.2KΩ resistor
L17 L18	Fil. Choke 4th. Video IF	0Ω .1Ω	.1Ω	D314			6232 ■	Includes 41.25MC trap, 4.7KΩ resistor
L19 L20	Fil. Choke 5th. Video IF	0Ω .1Ω	.1Ω	D315				Includes 39.75MC trap, 5MMF cap. & 3.3KΩ resistor
L21	Series Peaking Coil	4.2Ω			19-3093	TV-181	6177	93 Microhenries
L22	Shunt Peaking Coil	17Ω			19-3500	TV-188	6174	500 Microhenries
L23	4.5MC Trap	.1Ω			20-1004			
L24	Series Peaking Coil	8Ω			19-3125		6153	120 Microhenries, wound on 39KΩ resistor
L25	Series Peaking Coil	8Ω			19-3125 *		6153	120 Microhenries, wound on 39KΩ resistor
L26	Shunt Peaking Coil	17Ω			19-3500	TV-188	6174	500 Microhenries
L27	Sound IF	2.9Ω	2.9Ω				6203	
L28	Ratio Det.	4.6Ω	1.2ΩCT				1498	Tertiary winding -.2Ω
L29	Horiz. Osc.	110Ω						

* Add 8.2KΩ resistor externally.
■ Add 4.7KΩ resistor externally.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: Cal-Tech PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L30	.230ADC	37.7Ω	1.1HY			C-2974		26C44 ①	C-23X

① File out mounting hole.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: Cal-Tech PART No.	REPLACEMENT DATA: SYLVANIA PART No.	NOTES
M1	1N64*		1N60 or 1N132	Video Det.

* Some versions may use 1N60 crystal diode in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Cal-Tech PART No.	NOTES
M2	Tuner		VHF
M3	Relay		Power (On-off)
M4	Relay		On-off (Motor tuning)
M5	Switch		Channel Selector (Tuner)
M6	Switch		Channel Selector (Remote lead)
M7	Motor		Channel tuning
M8	Focus Magnet		Includes centering device
M9	Printed Circuit Strip	#1	Video IF
M10	Printed Circuit Strip	#2	Video Amp.
M11	Printed Circuit Strip	#3	Sound IF
M12	Printed Circuit Strip	#10A	Audio Amp.
M13	Printed Circuit Strip	#7	Vert. & horiz. sync.
M14	Printed Circuit Strip	#6B	Vert. Sweep
M15	Printed Circuit Strip	#5	Horiz. Sweep
M16	Printed Circuit Strip	#8	Horiz. Output
M17	Power Supply Unit	#4	
M18	Printed Circuit Strip	#9	Video Control

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V21, V22, V23 and V24. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C82, C83, C84, C80, R102, R103 and other associated components.	Check L29, C76, C77, C78, R95, R97, R94 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V22, V23 and V25. Check R5, R103, R102, C78 and other associated components.

BLOOMING

Check by substitution V22, V23, V24 and V25. Check C78, R102 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or no Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6, V7 and V8. Check video IF components for failure or change of value. Check remote control relay.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

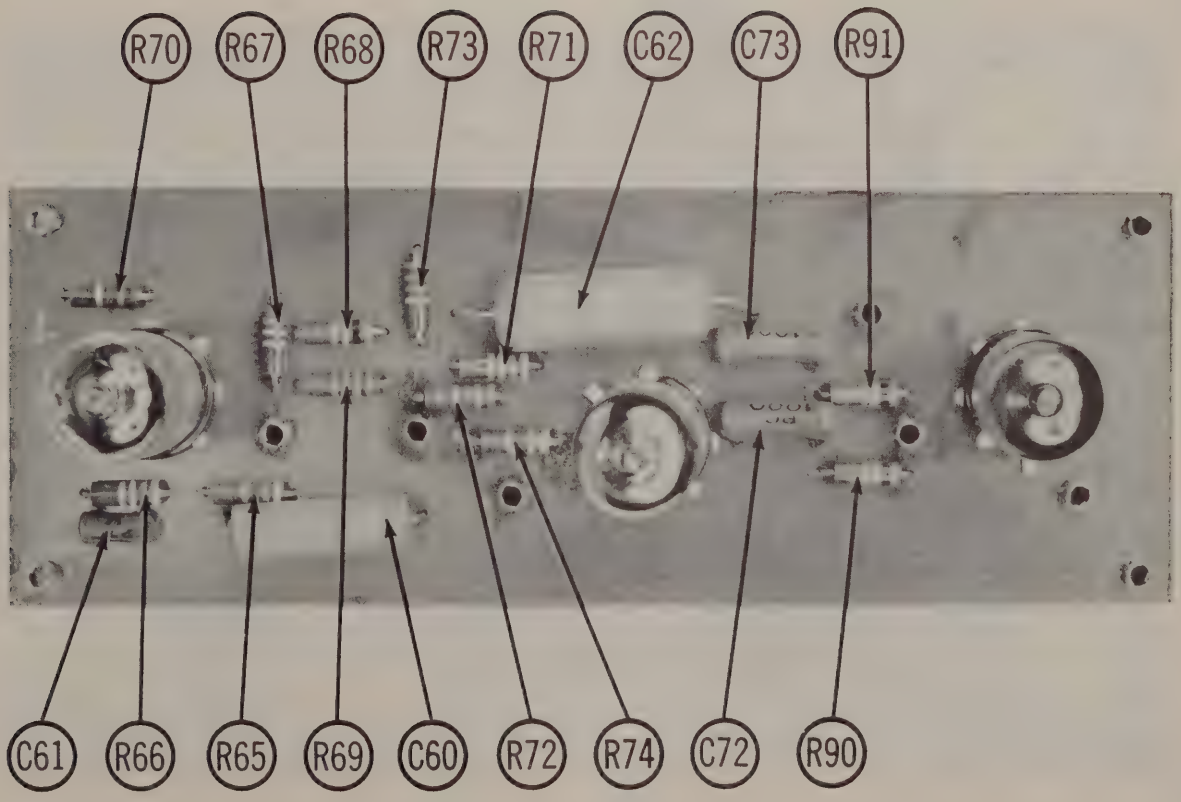
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



SUB-CHASSIS #7 SYNC UNIT

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENT

Touch-up adjustments of the VHF tuner oscillator circuit may be made thru the small hole in tuner case to the right of the channel selector shaft from the rear of the chassis.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

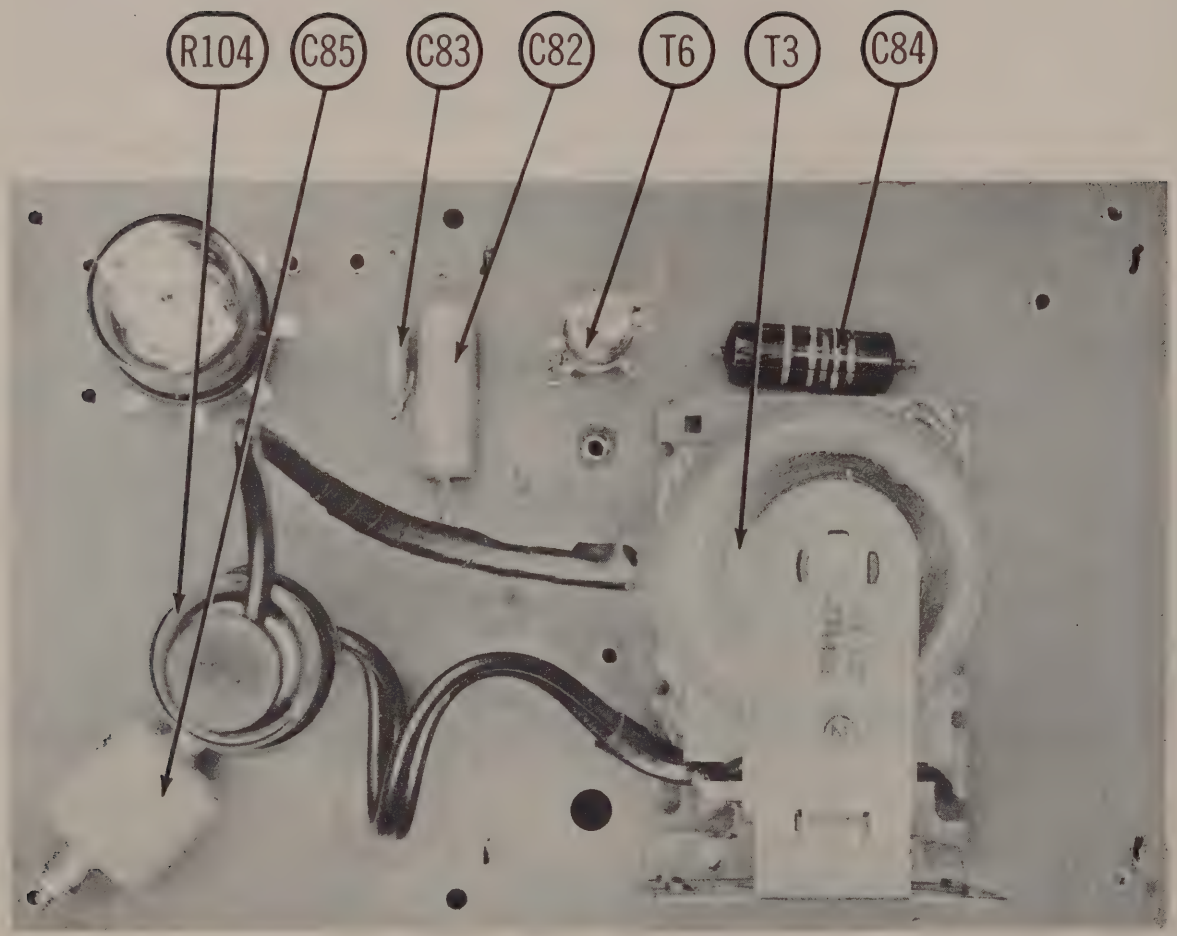
Adjustment of the horizontal oscillator is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (L29) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L28) located on top of the chassis.

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.



SUB-CHASSIS #8 H.V. UNIT

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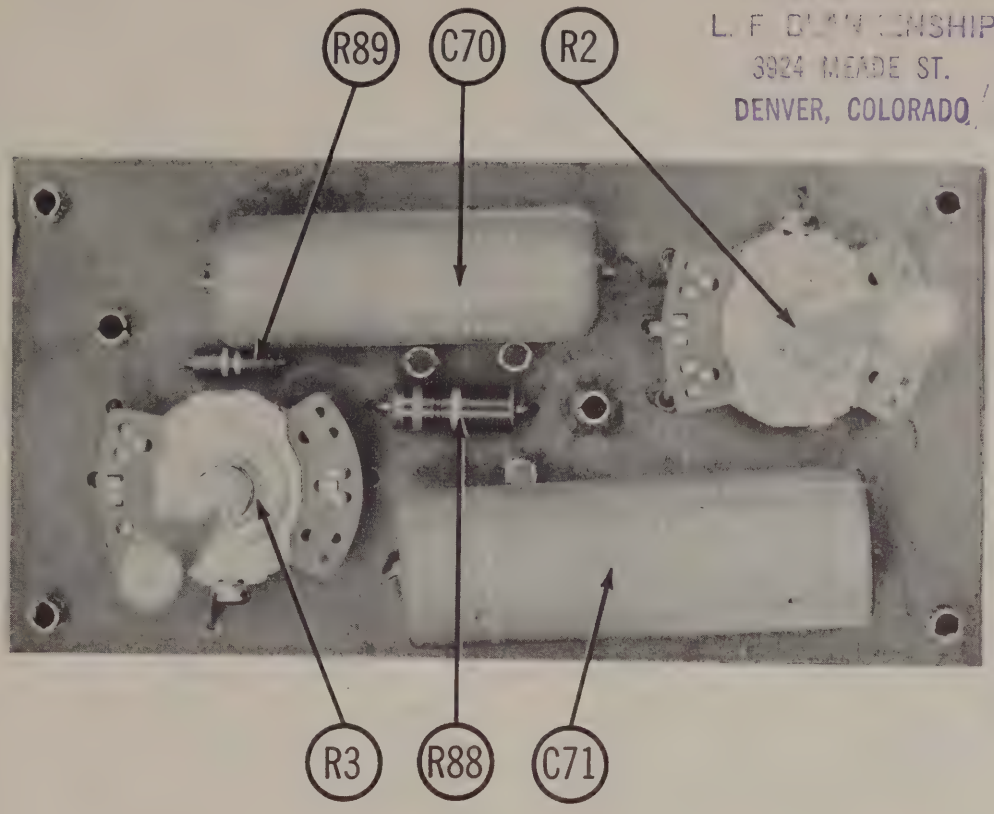
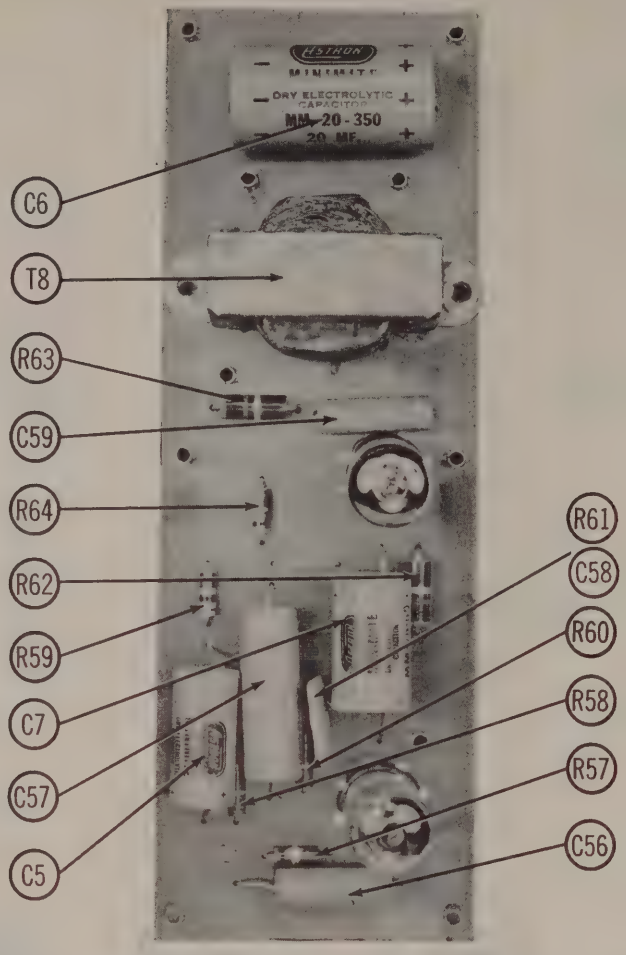
3924 MEADE ST.
DENVER, COLORADO

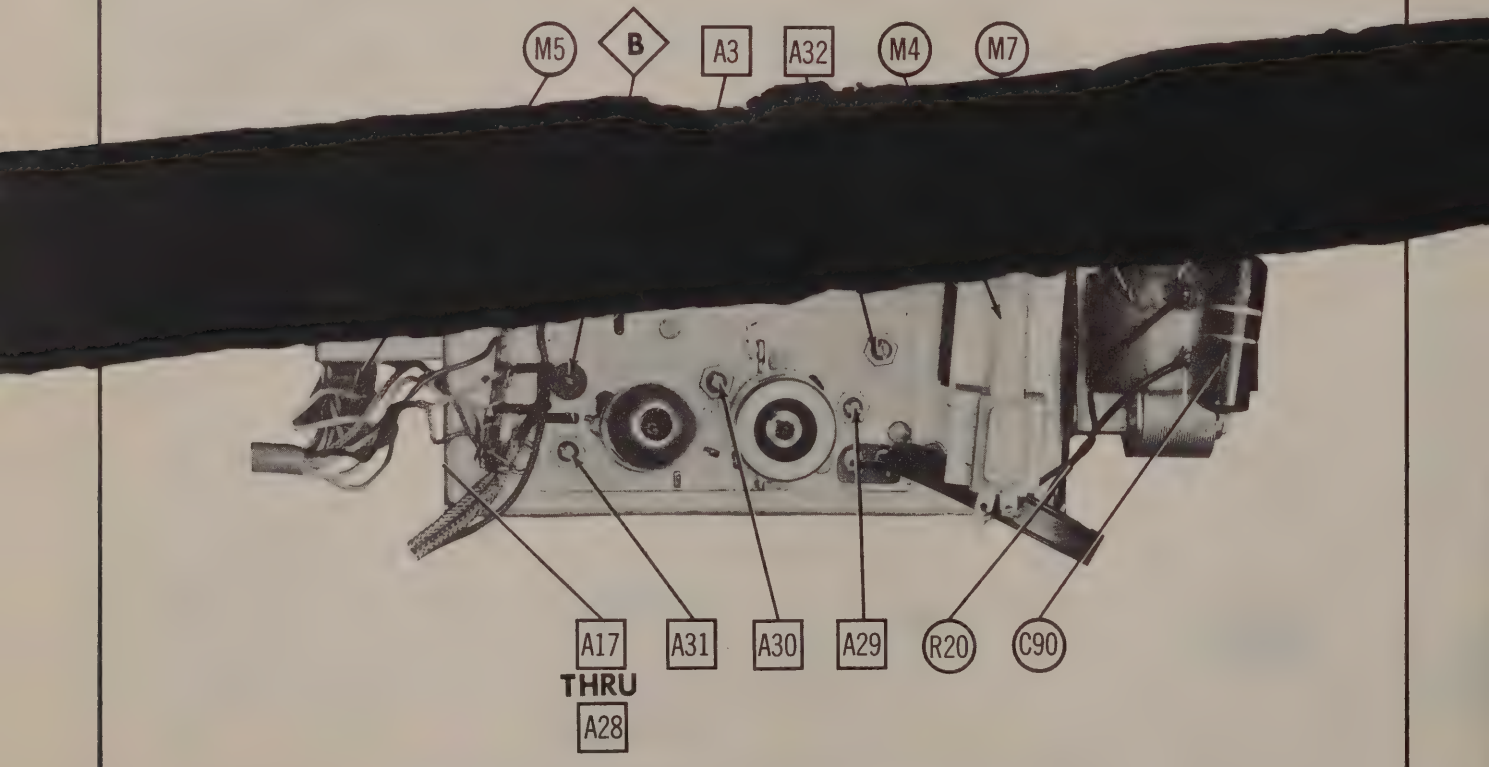


SUB-CHASSIS #9 VIDEO CONTROL UNIT

REMOTE HEAD



SUB-CHASSIS #10A AUDIO OUTPUT UNIT



SUB-CHASSIS #11 RF TUNER (TOP VIEW)

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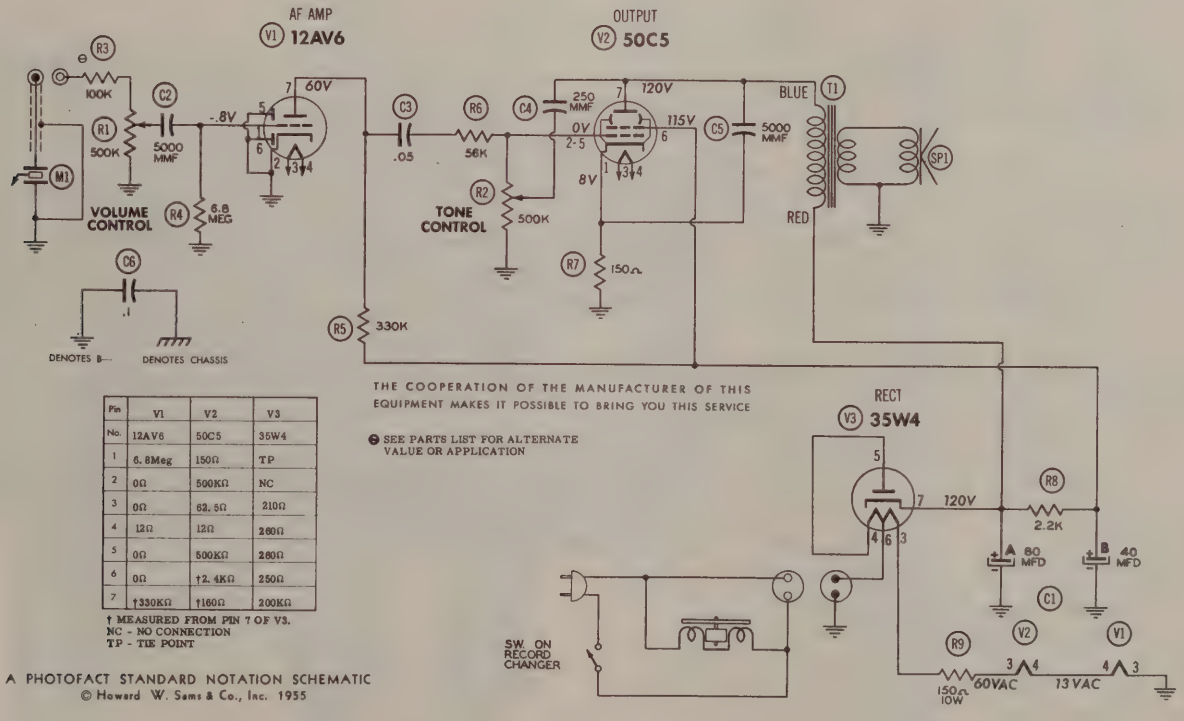
DENVER, COLORADO

CAPEHART
MODEL 23TP35BNL

TRADE NAME	Capehart Model 23TP35BNL
MANUFACTURER	Capehart-Farnsworth Co., Fort Wayne, Ind.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .25 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE V-M MODEL 950 - PHOTOFACT SET #216 - FOLDER #11 OR RECORD CHANGER MANUAL CM-5.



Pin No.	V1	V2	V3
1	12AV6	50C5	35W4
2	6.8Meg	150Ω	TP
3	0Ω	500KΩ	NC
4	0Ω	62.5Ω	210Ω
5	12Ω	12Ω	260Ω
6	0Ω	500KΩ	260Ω
7	0Ω	†2.4KΩ	250Ω
	†330KΩ	†160Ω	200KΩ

† MEASURED FROM PIN 7 OF V3.
NC - NO CONNECTION
TP - TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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CAPEHART
MODEL 23TP35BNL

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CAPEHART PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amp.	12AV6	12AV6	7BT	
V2	Audio Output	50C5	50C5	7CV	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CAPEHART PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.
C1A	80	150				TCD498	TDL-8040-150	FMT-1540
B	40	150						
C2	5000			D6-502	811-005	DC525	IMP6-D5	
C3	.05	400		DF-503		PT415	IMP4-S5	330415
C4	250			D6-251	GP2K-251	UC-5325		K-1325
C5	5000			D6-502	811-005	DC525	IMP6-D5	
C6	.1	600		DF-104		PT601	IMP6-P1	330601

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CAPEHART PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	C-5307-1	Q13-133	A47-500K-Z	AB-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	500KΩ	½	C-5307-1	Q13-133	A47-500K-Z	AB-60	U-48	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAPEHART PART No.	IRC PART No.	NOTES
R3	100KΩ	½		BTS-100K	Note
R4	6.8Meg	½		BTS-6.8Meg	
R5	330KΩ	½		BTS-330K	
R6	56KΩ	½		BTS-56K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CAPEHART PART No.	IRC PART No.	NOTES
R7	150Ω	½		BTS-150	
R8	2200Ω	½		BTS-2200	
R9	150Ω	10			

Note: Some versions may use a 470KΩ resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: CAPEHART PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.3KΩ	3.4Ω		Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

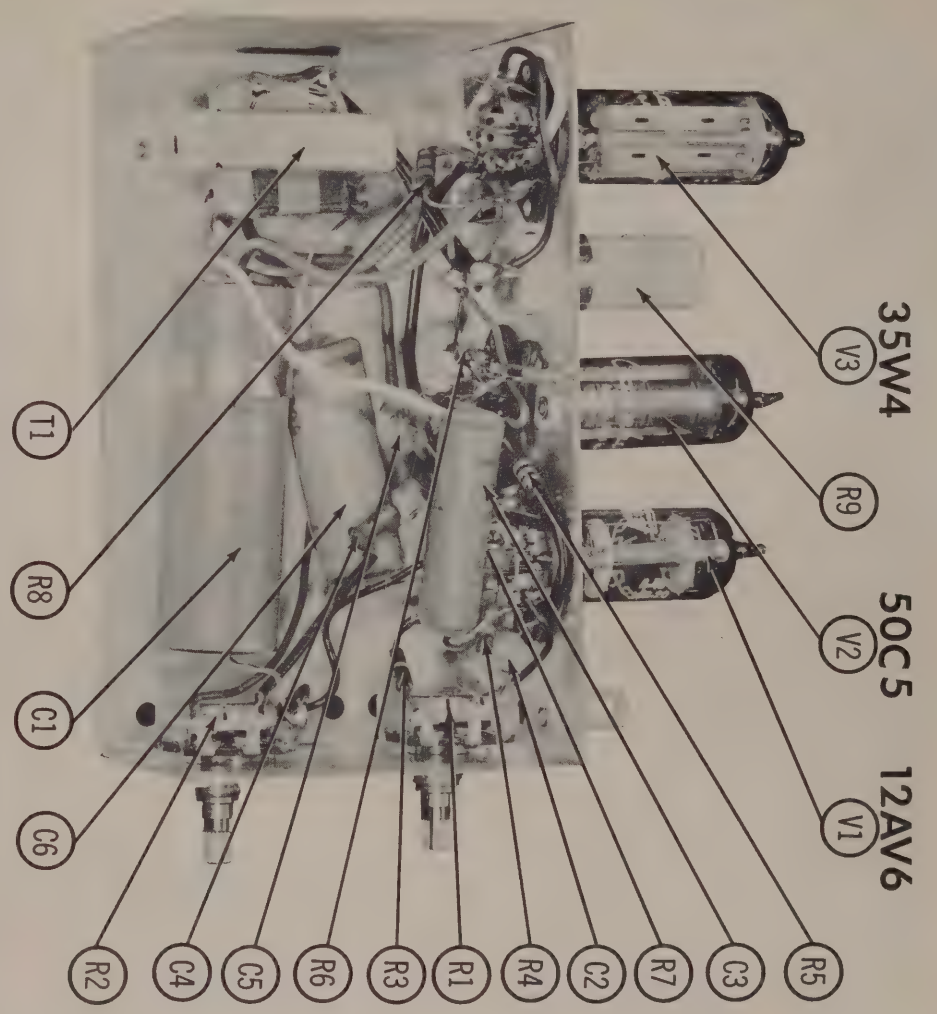
ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: CAPEHART PART No.	QUAM PART No.	NOTES
SP1	4" X 6"	PM	3.4Ω		46A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: CAPEHART PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1		55-T	GDJ	47	0-1 or 8-1 and 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: CAPEHART PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2		†S-66 or †♦S-66SD or ♦S-66D	†AC-434 or †♦AC-434D1 or ♦†AC-434D2 or ♦AC-434D	†W-75TPS or †♦W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

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[illegible], COLORADO

COLLARO
RC54

Figure 1

GENERAL INFORMATION

The Collaro Model RC54 Record Changer is designed to give entirely automatic pick-up arm positioning for 7", 10" and 12" records, which (providing they are of the same speed and same type of groove) may be intermixed in any order.

Turntable Speed..... 33 1/3, 45 or 78 R.P.M.

Record Capacity.....Ten 7", 10", or 12" records.

Record separation is accomplished by movement of a finger in the center spindle. This finger directly separates records having a 1/4" centerhole.

The tripping method used is the velocity type in which the striker arm engages a projection on the turntable hub to start the mechanism into cycle.

Model RC54 automatically shuts off after the last record has been played.

Connect this changer to an outlet supplying 100-125 volts, 60 cycle AC only, unless otherwise specified.

Manufactured by:
Collaro Limited
Ripple Works, By-Pass Road
Barking, Essex

Distributed in U.S. by:
Rockbar Corporation
211 East 37th Street
New York 16, N.Y.

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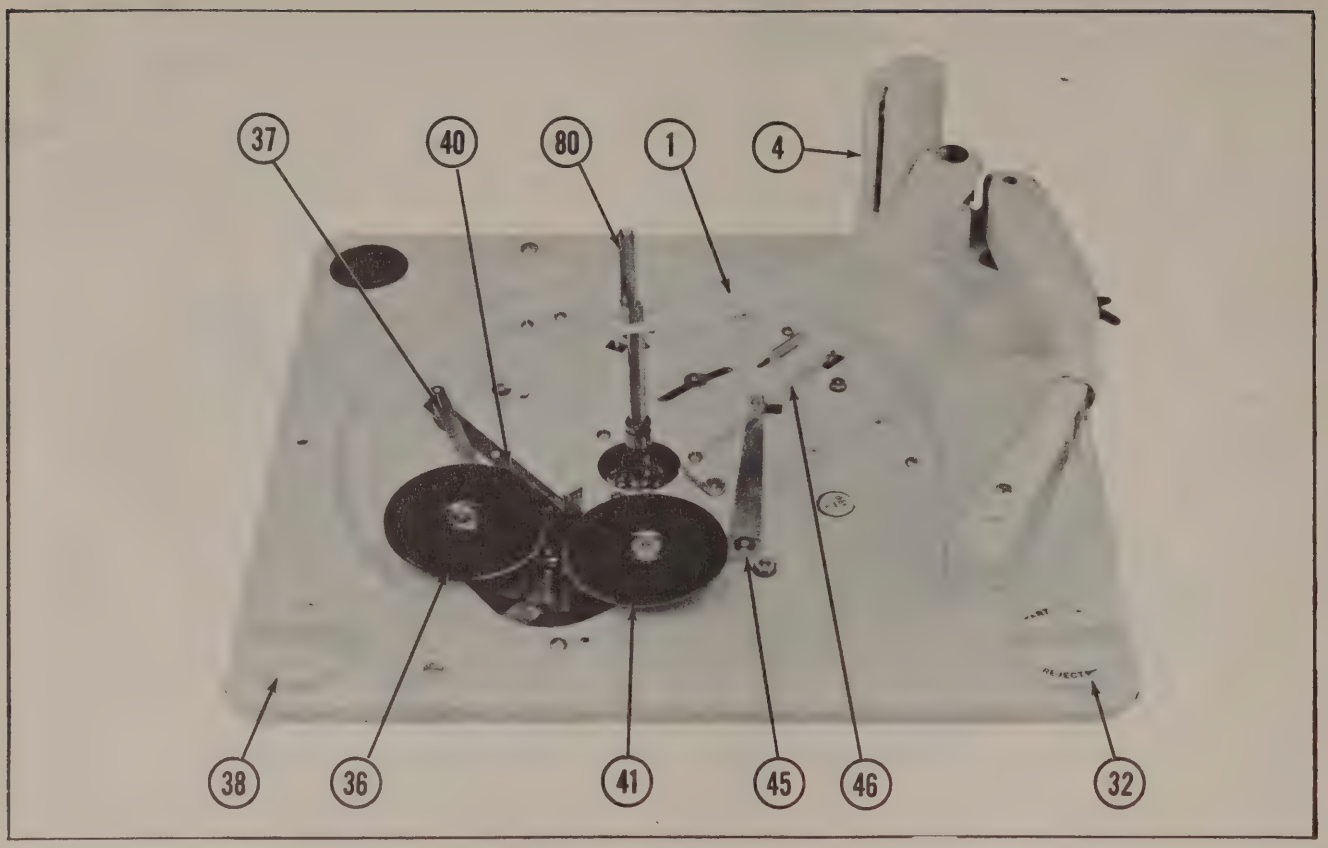

Figure 2

OPERATING INSTRUCTIONS

Loading-

1. Hold record balancing arm (1) near wide end, lift clear of spindle and swing out over pick-up arm. Place records on spindle and lower to offset step. Holding records level, replace record balancing arm on spindle.

NOTE: 7", 10", and 12" records can be intermixed on this changer, but be certain that they are of the same playing speed and have the same type of groove.

Starting-

To start the machine, after checking that stylus and speed controls are properly set, turn main control (32) to the left and release when the turntable starts to rotate. The changer will operate automatically until the last record has been played, at which time, the pick-up arm is returned to its rest and the supply to the motor is switched off.

Unloading-

Lift the record balancing arm and swing out over the pick-up arm. Using both hands, with fingers under the edge of bottom record, lift records straight up off spindle.

Rejecting-

A record may be rejected at any time by turning main control (32) fully to the left and releasing. The pick-up arm will immediately lift from the record and the next record will drop to the turntable and commence to play.

Stopping-

The changer may be stopped at any time by turning main control (32) fully to the right and releasing. The pick-up arm will immediately lift from the record and return to its rest position, when the supply to the motor will be automatically switched off.

SPECIAL FEATURES

Muting-

The pick-up cartridge is muted during the change cycle, thus avoiding the reproduction of undesirable noises during the interval between records, and also avoiding the unpleasant "running down" effect due to slowing of the turntable when a record is rejected or when the "Stop" control is operated.

Retractable Drive-

Rubber tired drive wheels (36 and 41) are automatically retracted when the unit is switched off. The development of flats on the tires, due to prolonged contact under pressure during periods of disuse, and consequential noisy running and unevenness of turntable speed is thus avoided.

CHANGE CYCLE

It is recommended that the change cycle operation be observed by rotating the turntable by hand. The action described below can then be readily followed and the function of each part more easily understood.

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ENVER, COLORADO

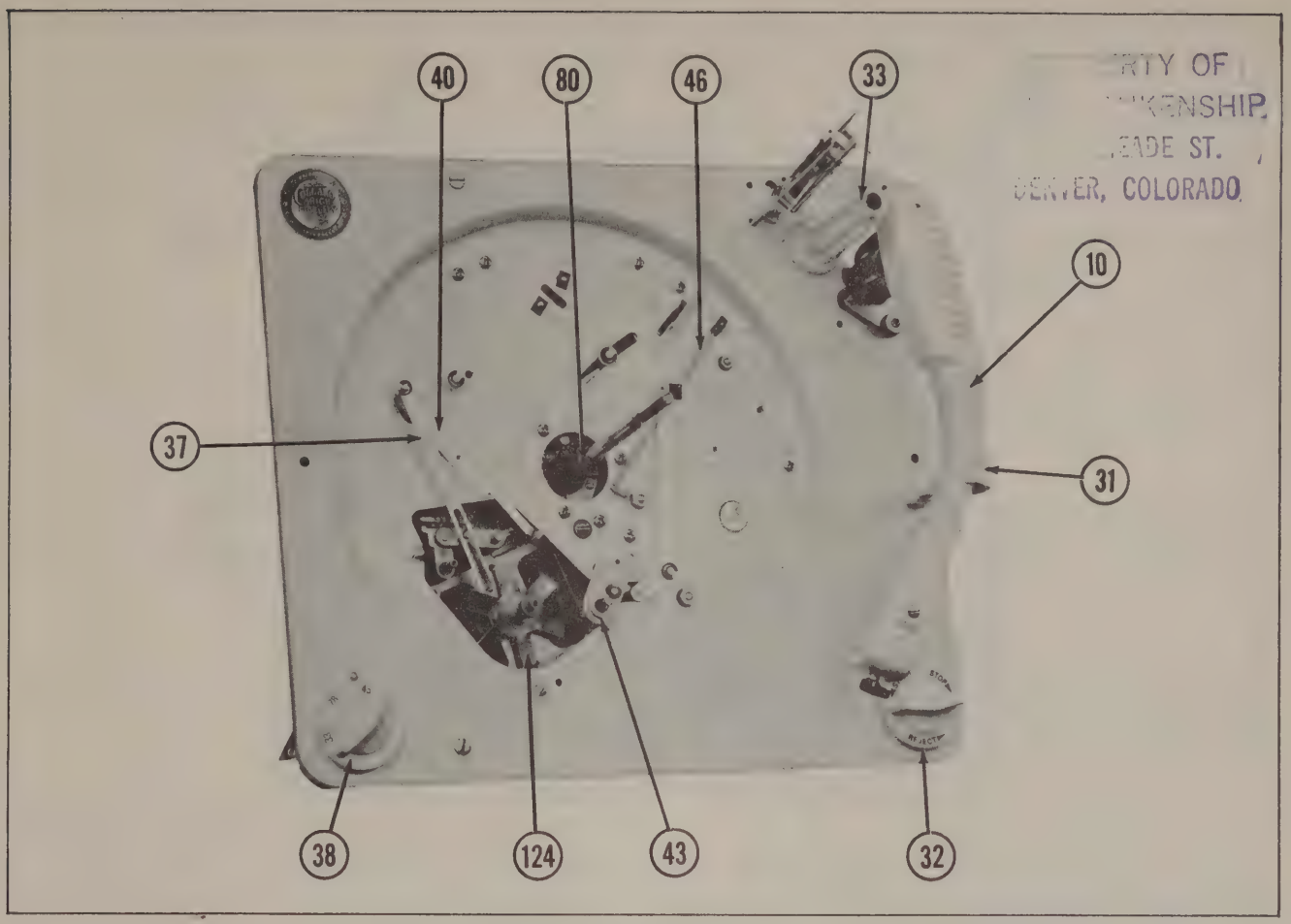

Figure 3

This changer is provided with what is known as a "Velocity Trip" mechanism. The change cycle is started by the faster inward motion of the pick-up arm when the needle enters the lead-out groove at the end of a record.

The pick-up arm assembly and the pick-up tripping arm (20) are secured together and move in unison. As the pickup arm nears the end of a record, the pin on the end of pickup tripping arm (20) pushes trip feed lever (78), which, in turn, carries striker arm (77) in toward the turntable hub. Striker arm (77) is fed inward by the friction provided by its own weight resting on the curved end of trip feed lever (78).

While a record is playing, the slight movement of striker arm (77) is not sufficient to trip the mechanism because, on each revolution of the turntable, the wiping action by the turntable hub projection (point "A" on exploded view) moves striker arm (77) back far enough to clear the hub projection.

When the needle enters the lead-out groove of a record, causing the pick-up arm to advance rapidly toward the spindle, striker arm (77) is moved fast enough and far enough to definitely engage the turntable hub projection (point "A" on exploded view). As the hub projection engages with striker arm (77), the striker arm is pushed away from the turntable hub (toward the pick-up arm) far enough to cause gear release lever actuating link (45) to pivot in such a manner so as to release main gear release lever (52) from the pin located on top of main gear (93). This causes two things to happen. First, it unlocks main gear (93) from its out of cycle position. Secondly, it permits cycle drive wheel (41) and its associated gear train to be pulled into contact with the motor shaft by action of spring (50), thus being in position to drive the mechanism through the change cycle.

As main drive gear (93) starts to rotate, operating bar (107) which is secured in an eccentric position on main drive gear (93), is pulled toward the front of the changer. The pick-up arm actuating lever (105) moves to the front along with operating bar (107) and in so doing, relieves all pressure from the lift pin and muting switch link (114), and from the lift pin and muting switch lever (115). This action permits the lift pin lift spring (22) to raise the lift pin (19), which in turn, raises the pick-up arm from the record.

At the same time, muting switch assembly (116) is closed, shorting out the pick-up cartridge, thus preventing any undesirable noises from coming through the amplifier while the mechanism is in cycle.

Simultaneously, the positioning plate lift spring (96) raises the pick-up arm positioning plate (94) into contact with the pick-up tripping arm (20). This is the connection that directs the pick-up arm inward, through a friction clutch arrangement, when that phase of the change cycle is reached.

The pick-up arm lateral lever (99) is now pulled forward by the pick-up arm actuating lever (105), swinging the pick-up arm clear of the turntable.

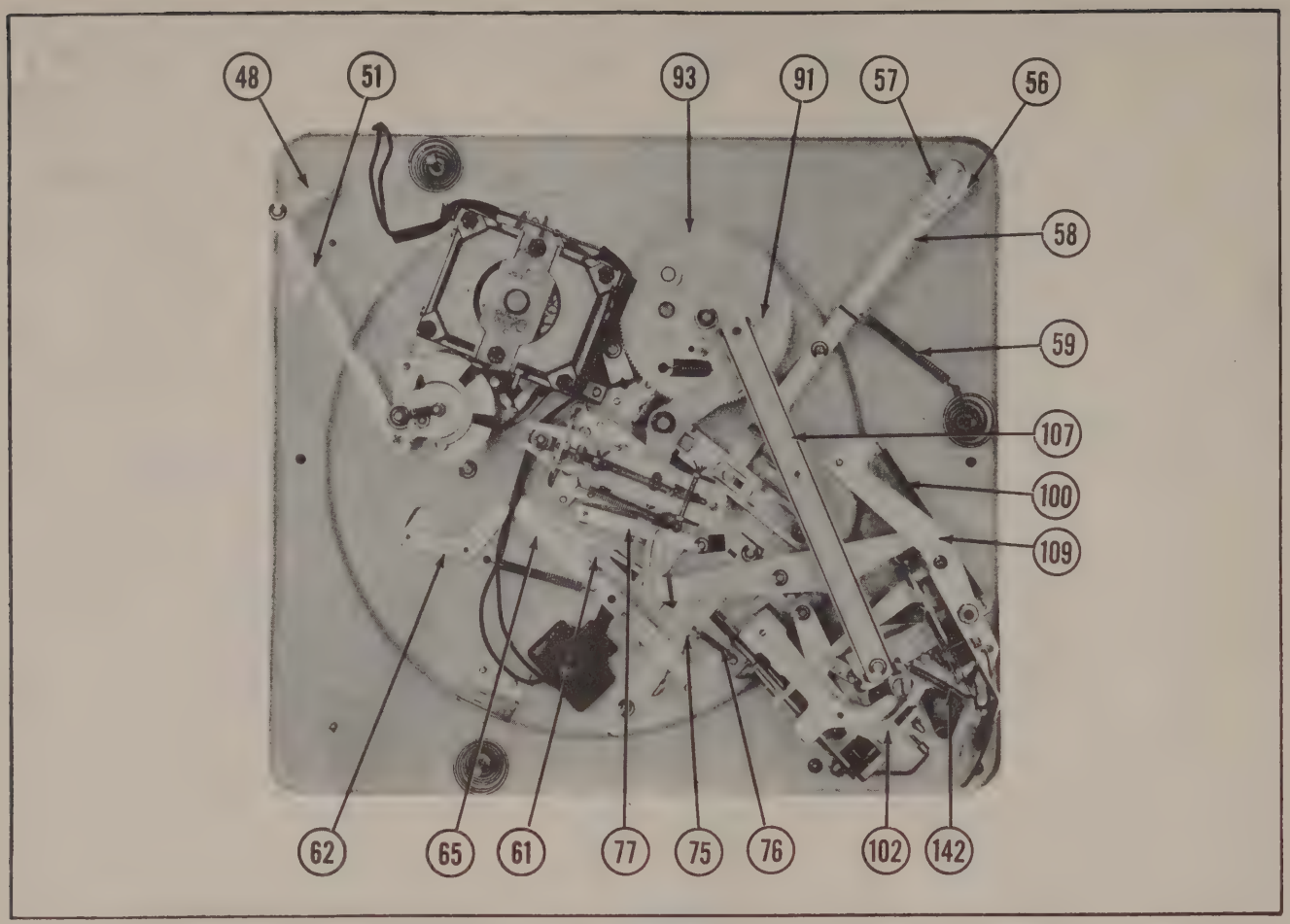

Figure 4

At this time, the roller on the bottom of main drive gear (93) actuates the record dropping lever (91) which in turn, moves the spindle slide plate (89) in such a manner so as to actuate the record selector pawl (85). Selector pawl (85) moves upward until its upper end engages the center hole of the lower-most record in the stack and then moves sideways sufficiently to push the record off the spindle shelf.

The main drive gear (93) has rotated far enough that operating bar (107) has reached its maximum forward travel and now starts moving toward the rear of the changer. As this takes place, the pick-up arm actuating lever (105), which is connected to operating bar (107), also moves toward the rear of the changer. This releases the pick-up arm return lever (101) and through action of the pick-up arm return spring (100) pivots to the rear and in so doing carries the pick-up arm positioning plate (94) with it, which in turn, through the friction clutch arrangement between positioning plate (94) and pick-up tripping arm (20) moves the pick-up arm in over the record.

The mechanism is automatically indexed for the pick-up arm to land on either a 7", 10", or 12" record. This is accomplished by the record gate finger (26). This finger has three positions, upper for 7" set-down, middle for 10" set-down, and lower for 12" set-down. Each time the mechanism goes through a change cycle the pick-up arm lands in the 7" position, unless a 10" or 12" record contacts record gate finger (26). Consequently, the set-down positioning lever (30) blocks the pick-up arm positioning plate (94) at one of three positions, depending on the size record which has been dropped from the spindle shelf.

When the pick-up arm is positioned directly over the record lead-in groove, the pick-up arm actuating lever (105) actuates the lift pin and muting switch link (114), which in turn, pivots the lift pin and muting switch lever (115) downward to lower the pick-up arm to the record.

During the preceding sequence of lowering the arm to the record, muting switch (116) opens and the pick-up cartridge becomes "live" again.

The pin located on top of main drive gear (93) now moves against the main gear locking lever (52) and locks the main gear in the out of cycle position. This action also draws the cycle drive wheel (41) away from the motor shaft, completing the change cycle.

AUTOMATIC STOP

The automatic stop is brought into operation after the last record has been played by reason of the record balancing arm (1) having dropped to its fullest extent. This depresses the auto-stop lever (111) which in turn allows the auto-stop catch plate (112) to fall and retain the pick-up arm return lever (101). The pick-up arm is thus not returned inward over the records, but subsides on to its rest at the end of the change cycle. At the same time the pick-up arm return lever (101),

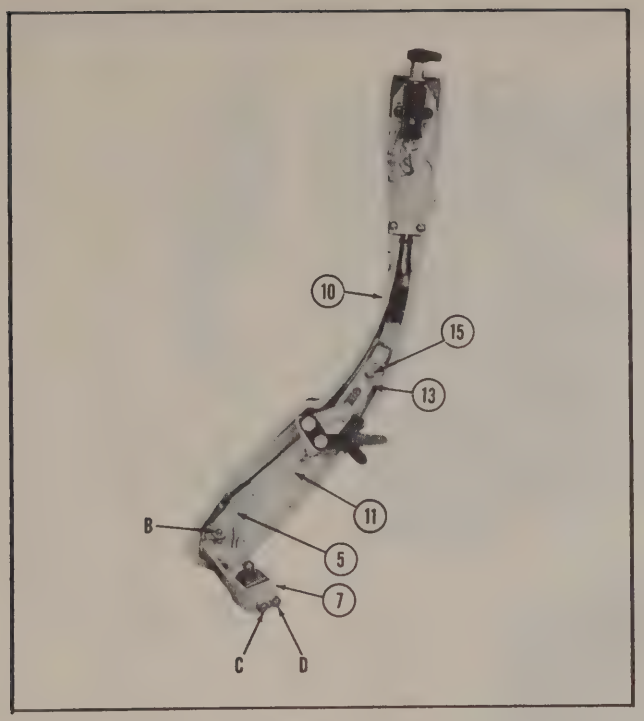

Figure 5

through the medium of the switch-off plate (108), restrains the switch-off link (67) against the pull of spring (76). The turned up end of the switch-off link (67) is thus held in the path of the stud, located on top of operating bar (107), and at the end of the cycle the notch in the switch pawl (65) is disengaged and the switch actuating spring (66) holds the motor switch open and simultaneously retracts idler wheel (36) through the medium of actuating lever (62) and link (37).

On switching on again, stop lever (58) disengages the turned-up end of the switch-off link (67) from the stud on top of operating bar (107) thus allowing the notch in the switch pawl (65) to engage with the pin on the underside of the baseplate so holding the motor switch closed and at the same time holding idler wheel (36) in contact between the motor pulley and turntable rim. If, at the same time, one or more records have been loaded on to the machine, the auto-stop lever (111) will lift under the influence of its spring (46) as soon as the pick-up arm return lever (101) is moved momentarily out of the notch in the auto-stop catch plate (112) during the change cycle. This removes all restraints on the various parts of the mechanism, and the cycle is completed in the normal way. If, however, no records have been loaded on to the machine and the record balancing arm (1) remains dropped to its fullest extent, the pick-up arm return lever (101) will not be released, and the pick-up arm will again subside on to its rest and the machine will switch-off at the completion of the cycle.

The purpose of the small pawl attached to the auto-stop catch plate (112) is to prevent the pick-up arm return lever (101) from being restrained as the last record falls, which would cause the machine to switch off without playing the last record. This pawl thus delays the restraint of the pick-up arm return lever (101) until the next cycle, i. e., after the playing of the last record is completed.

For satisfactory operation it is essential that all parts mentioned above should work absolutely freely, and that spring (46) should positively actuate the auto-stop lever (111) lifting the auto-stop catch plate (112) with it. At the same time, spring (46) must not be so strong as to prevent the weight of the record balancing arm (1) fully depressing the auto-stop lever (111).

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ADJUSTMENTS

Needle Set-Down-

If set-down positions are erratic, check first of all that the nut shown at point B (Figure 5) is securely tightened.

The position at which the stylus alights on the record may be adjusted, if necessary, by means of the two screws C and D (Figure 5). To bring position in, loosen screw C and tighten screw D the same amount.

NOTE: This adjustment is very sensitive; turn the screws only a small fraction of a turn at a time until the desired adjustment is obtained, and finally check that position is correct after both screws have been firmly tightened. Avoid excessive force when tightening these screws.

This machine gives automatic positioning for 7", 10", and 12" records and the above adjustment affects all positions equally. The design of the mechanism ensures that when the 7" setting down position is correctly adjusted the 10" and 12" positions will also be correct.

PICK-UP ARM HEIGHT ADJUSTMENT-

The height to which the pick-up arm is lifted during the change cycle is controlled by the lift pin (19). To make adjustment, if necessary, switch off the power during the change cycle at the point where the pick-up arm has just swung outwards over its rest. The lift pin (19) may then be screwed up or down as required by inserting any suitable pin into the hole drilled near its round projecting end. Correct adjustment is when the pick-up arm clears the top of its rest by approximately 1/8".

Record Dropping Adjustment-

This adjustment should not normally be necessary unless the machine has been dismantled to make replacements.

To replace or check adjustment:

1. Remove all records and switch off power.

2. Loosen hex. head screw, located on bottom of main drive gear (93), two or three turns.

3. Operate start control.

4. Turn main drive gear (93), by hand, until record dropping lever (91) is moved to its extreme position. The roller on the bottom of main drive gear (93) will then be behind and covered by operating bar (107).

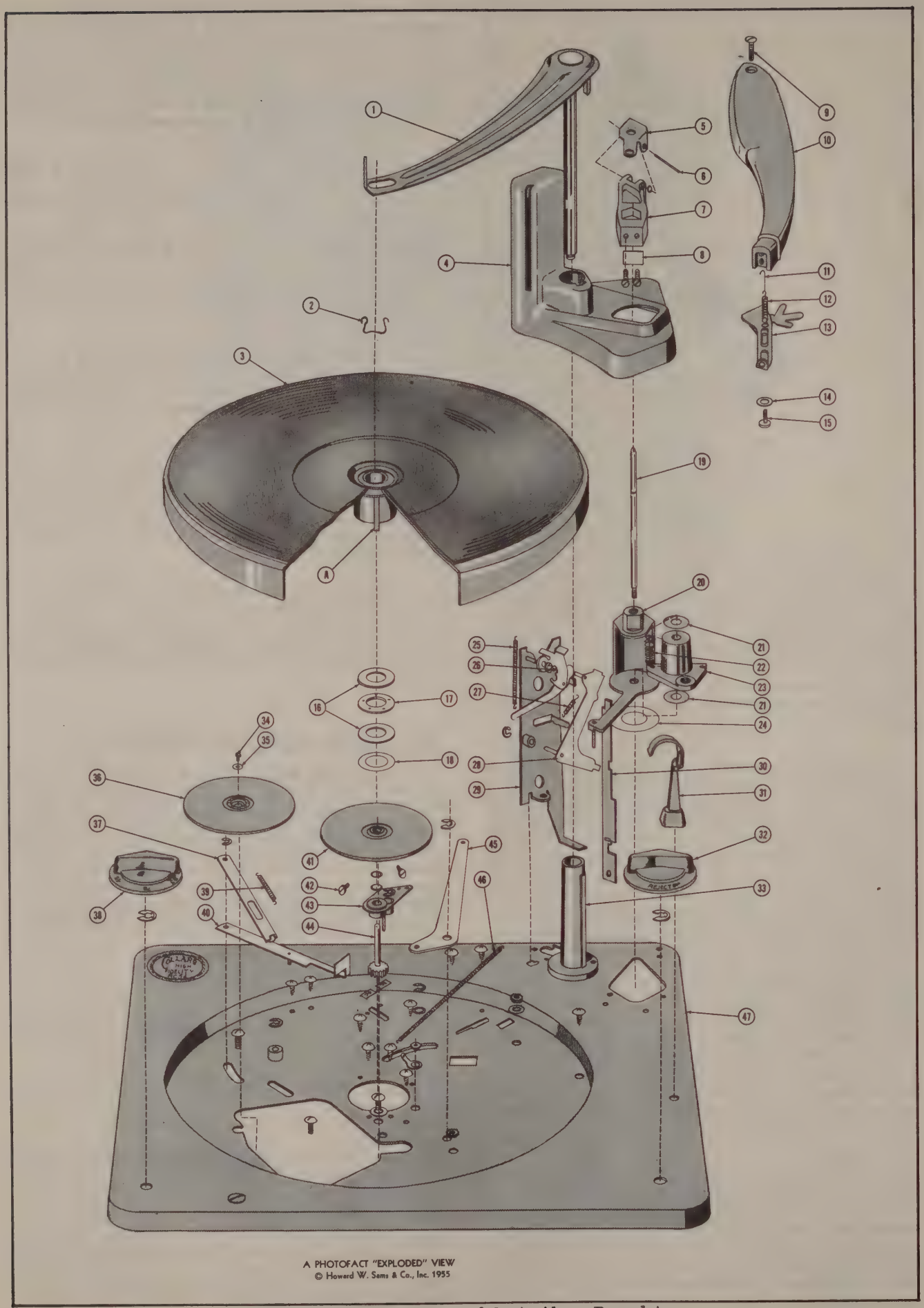

Figure 6A. Exploded View of Parts Above Baseplate

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[illegible] PLACE ST.
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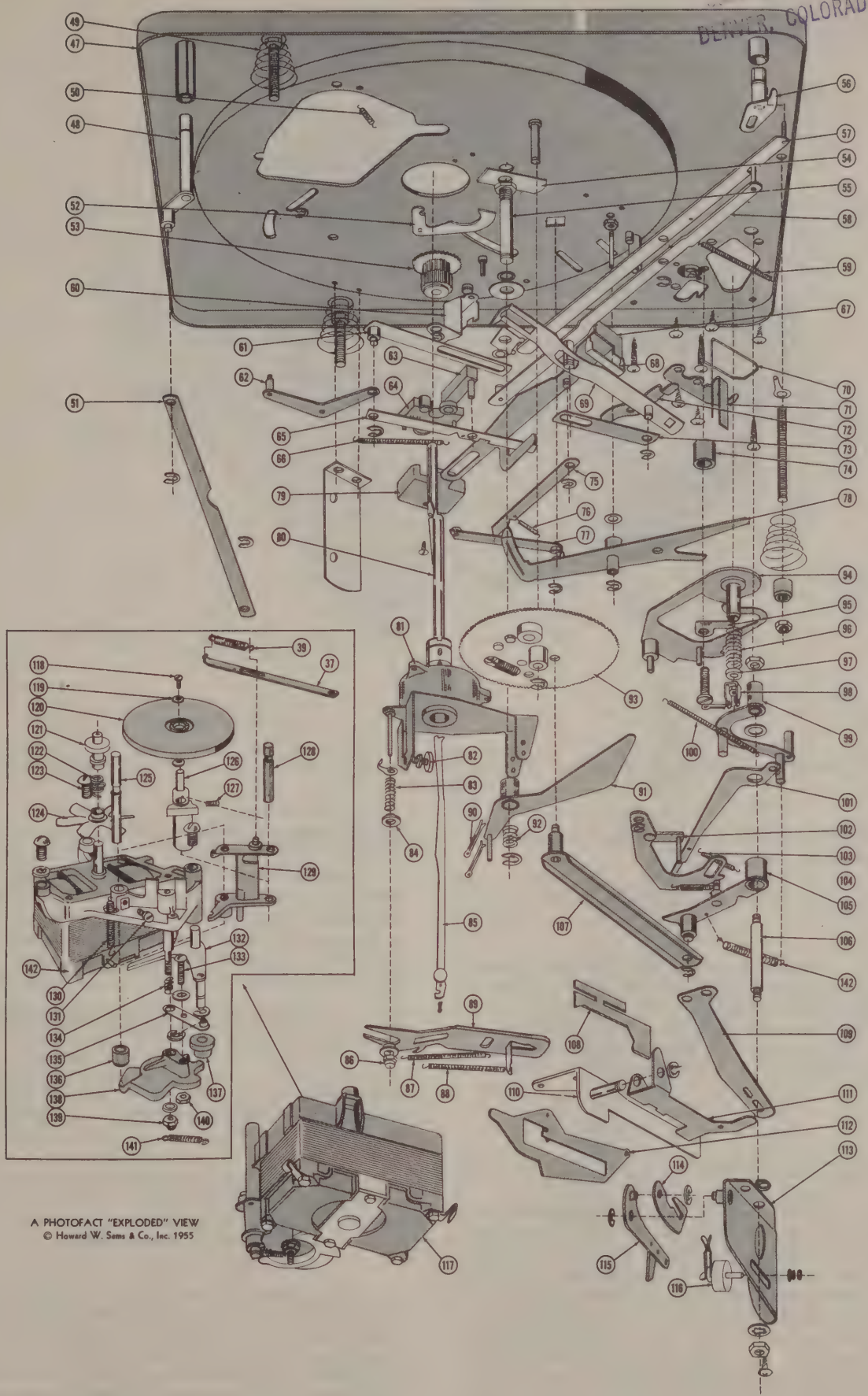

Figure 6B. Exploded View of Parts Below Baseplate

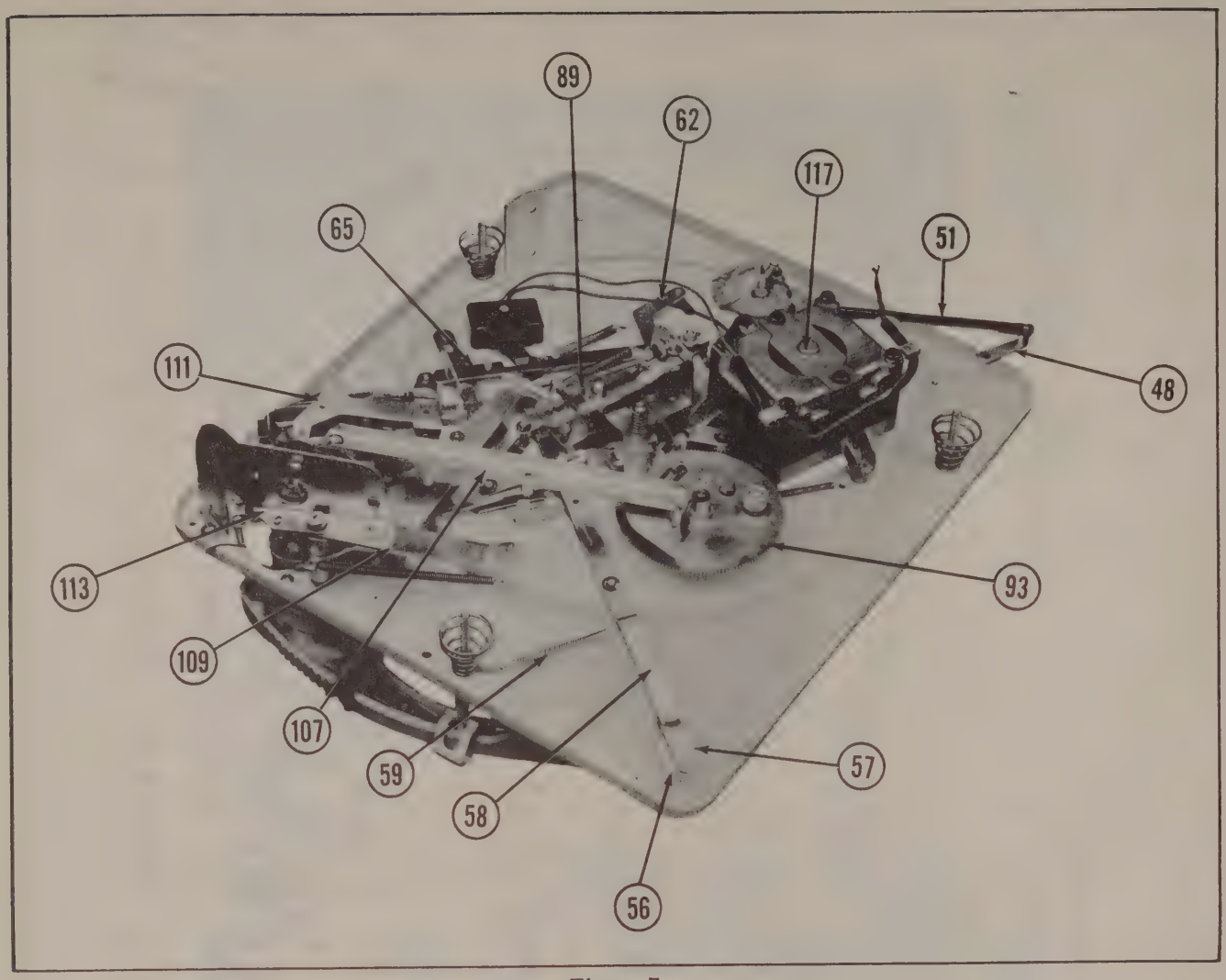

Figure 7

5. Tighten the hex. head screw, located on the bottom of main gear (93), securely.

6. Reconnect power and test with a full load of 12" records.

CAUTION: The record spindle, dropping mechanism, and turntable bearing housing are built as a pre-adjusted unit. Under no circumstances should the nut (86) or the stop (82) be disturbed from their original setting. If damage has occurred or the adjustment disturbed, it is recommended that this mechanism be replaced as a unit.

Automatic Trip Adjustment-

This is of the "Velocity Trip" variety and is designed to be extremely light and sensitive in operation. No adjustment is provided, and the only likely cause of failure is if the curved end of the feed lever (78) has been accidentally bent upwards or downwards so that the end of the striker arm (77) cannot work freely in the apeture in the side of the diecast housing carrying the turntable bearing, etc. Both the feed lever (78) and and striker arm (77) must be absolutely free on their respective pivots. It is also worthy to note that the long pin on the front of pick-up tripping arm (20) must always lie within the forked end of trip feed lever (78).

Needle Pressure Adjustment-

Set the weight compensating control (13) in the "LP" position. Use a suitable gram scale and check the needle pressure at the point where the needle lands on the record. When the needle pressure is obtained for the "LP" position, the pressure for the "Std." position will also be correct.

The needle pressure may be adjusted, if necessary, as follows:

(Refer to Figure 5) Loosen screw (15) and move weight compensating control (13) back or forward to obtain the desired pressure.

MAINTENANCE OF MOTOR AND TURNTABLE DRIVE

No lubrication of the motor is normally required as it is fitted with self-oiling bearings. The only maintenance necessary consists of occasional removal of the turntable to clean its inner rim and the driving surfaces of the motor pulley and idler wheel, by wiping with a clean solvent-moistened rag. The thrust washers and ball race located under the turntable should also be examined, and if necessary, washed clean with a petro-

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L. F. BLANKENSHIP
3824 [illegible] ST.
DENVER, COLORADO

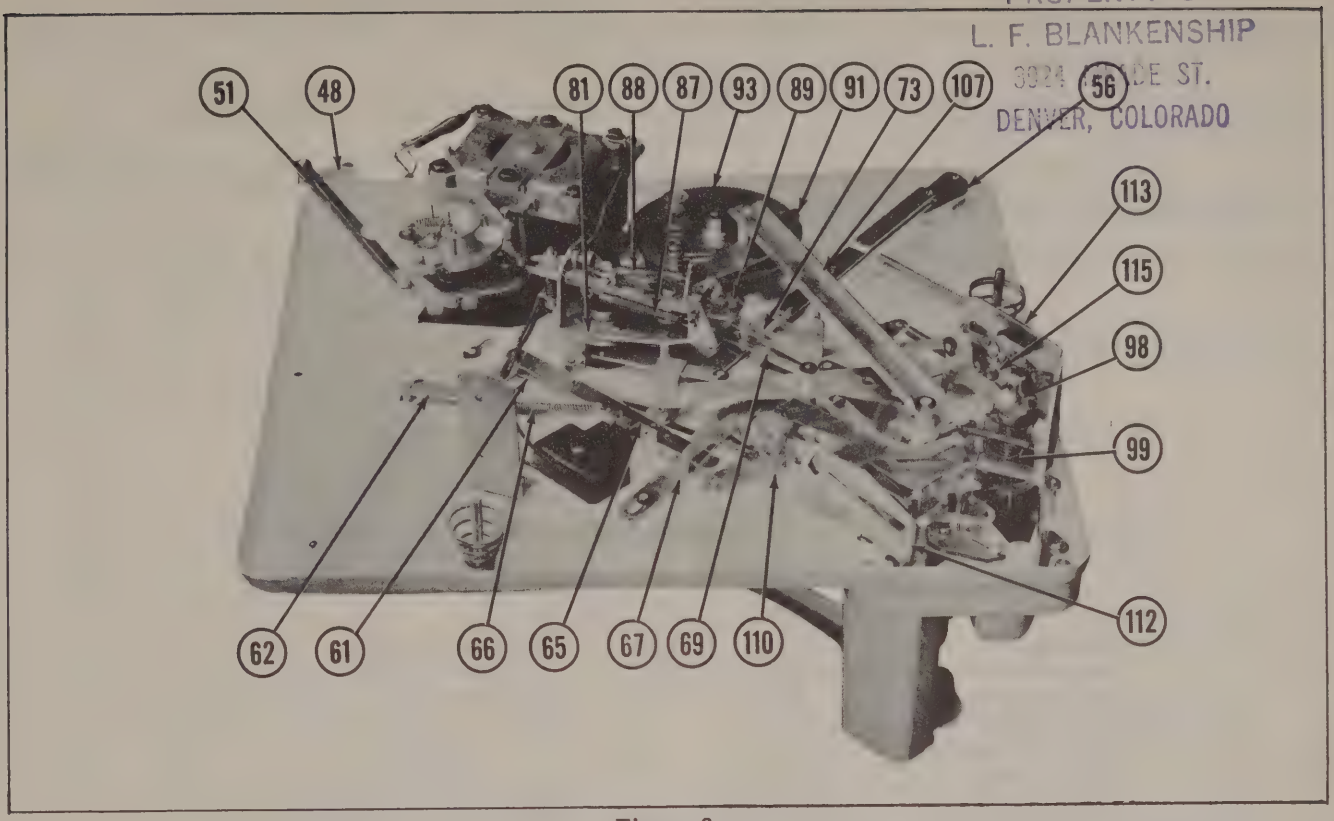


Figure 8

leum solvent and relubricated with a small amount of soft grease.

TROUBLES AND REMEDIES

Records Fail To Drop-

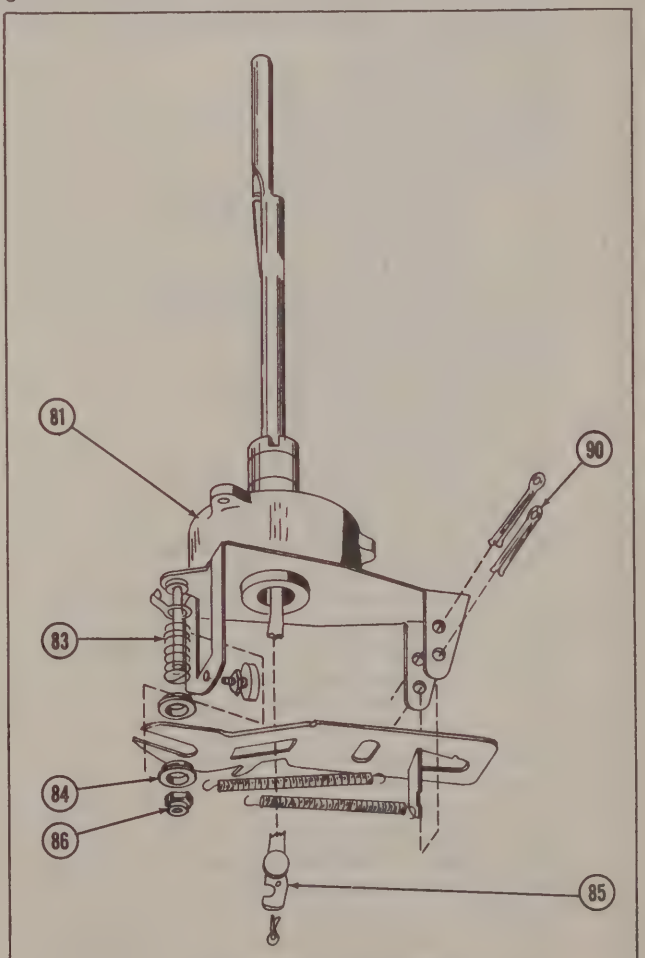
If records fail to drop from the spindle shelf, worn or chipped center holes can be the cause and the use of records damaged in this way should be avoided. If failure occurs when using undamaged records, check adjustment of record dropping mechanism as described under "Record Dropping Adjustment".

More Than One Record Drops At A Time-

Worn or chipped center holes may be the cause. Also make sure that the small sliding member housed in the top of the spindle drops freely under its own weight. If not, it is probable that some foreign matter has become lodged between the slide and side of the groove in which it works, and this may best be dislodged by means of a razor blade. Grease or oil on the slide may also be the cause of its failure to drop freely, and consequently great care should be exercised if the turntable is removed to avoid depositing any oil on the slide from the turntable bearing. A petroleum solvent applied with a small brush should be used to clean the parts if this cause of failure is suspected.

Changer Fails To Shut-Off After Last Record Has Been Played-

1. Record balancing arm (1) is not falling to its fullest extent and making contact with the auto-stop lever (111) This could be due to the balancing arm shaft (1) sticking in its housing, and this should be freed by cleaning



RECORD DROPPING MECHANISM

thoroughly. Remove the shaft, if necessary, by first removing the "C" washer at the bottom of the shaft. Do not lubricate.

Check that parts (67, 75, 111, and 112) are free on their respective pivots.

Pickup Arm Does Not Track Across Record Properly-

1. Needle worn or clogged by an accumulation of lint, dirt, etc.

2. Make certain that the proper needle is used for the type record being played.

3. Check that the pick-up arm pivots freely and that its movement is not retarded by pick-up leads which are too tight.

Continuous Operation Of Change Cycle-

If the change mechanism operates continuously without allowing each record to play to the end the cause can be:

1. Weakening or displacement of spring (50).

2. Main gear release lever (52) being stiff on its pivot.

3. Automatic trip lever (45) being stiff on its pivot.

PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	3680	Record Balancing Arm	45	3739	Automatic Trip Lever
2	2843	Turntable Retainer	46	2526	Automatic Stop Lever Spring
3	3687	Turntable Assembly, Consists of:	47		Baseplate
		Rubber Mat	48	3665	Speed Control Crank
		Turntable Hub	49	3987	Mounting Spring
4	3518	Pick-up Base & Set-Down Selector Housing	50	3726	Cycle Drive Wheel Actuating Spring
5	2486	Pick-up Arm Mounting Bracket	51	3664	Speed Control Lever
6	2505	Hinge Pin	52	3736	Main Gear Release Lever
7	1993	Pick-up Arm Hinge	53	3734	Intermediate Cycling Gear
8	3909	Set-down Positioning Shim	54	3768	Dropping Stud Stabilizing Plate
9	2959	Pick-up Arm Mounting Screw	55	3767	Record Dropping Lever Mtg. Stud
10	2872	Pick-up Arm Shell	56	3733	Start-Stop-Reject Shaft & Cam
11	2958	Weight Compensating Link	57	3730A	Reject Lever
12		Weight Compensating Spring	58	3731B	Stop Lever
13	2784	Weight Compensating Control	59	2146	Reject Lever Return Spring
14	14	Flat Washer	60	3584	Intermediate Cycling Gear Mtg. Bracket
15	46	Weight Compensating Control Adj. Screw	61	3728	Idler Wheel Actuating Link
16	3894	Turntable Bearing Washers (Steel)	62	3727	Idler Wheel Actuating Lever
17	2884	Bearing (Ball Race)	63	3930	Switch Actuating Cam
18	3144	Neoprene Washer	64	2996	On-Off Switch
19	3760	Pick-up Arm Lift Pin	65	3607	Switch Pawl
20	3755	Pick-up Tripping Arm	66	3726	Switch & Idler Wheel Actuating Spring
21	3007	Flat Washer (Steel)	67	3899	Switch-off Link
22	3761	Lift Pin Lift Spring	68	3737	Switch-off Link Pivot Bracket
23	3571	Pick-up Arm Mounting Base	69	3898	Spindle Deactivating Lever
24	2193	Clutch Washer (Felt)	70	3601	Set-down Selector Wire
25	3634	Record Gate Finger Lift Spring	71	3751	Selector Wire Mounting Bracket
26	3743	Record Gate Cam & Finger	72	3604	Manual Stop Actuating Lever
27	3633	Record Gate Lever Actuating Spring	73	3876	Spindle Deactivating Link
28	3744	Record Gate Lever	74	3643	Plate Guide Spacer
29	3745	Record Gate Assembly Mtg. Bracket	75	3877	Switch-off Link
30	3610	Set-down Positioning Lever	76	3661	Switch-off Link Spring
31	3818	Rest Post & Lock Assembly	77	3715	Striker Arm
32	3957	Start-Stop-Reject Knob	78	3713	Trip Feed Lever
33	3763	Balancing Arm Column	79	158	Switch Cover
34	126	Idler Wheel Mounting Screw	80	3225	Spindle Body
35	2514	Flat Washer (Fibre)	81	3778	Turntable Axle
36	3199	Motor Idler Wheel	82	3719	Record Dropping Adj. Screw
37	3650	Idler Wheel Retracting Link	83	3638	Compression Spring
38	3956	Speed Control Knob	84	2463	Shoulder Washer
39	308	Retracting Link Spring	85	3238	Record Selector Pawl
40	3911	Cycle Delay Lever	86	1276	Locknut
41	3689	Cycle Drive Wheel	87	2146	Spindle Slide Plate Return Spring
42	3631	Drive Wheel Mtg. Screw	88	2840	Selector Pawl Return Spring
43	3735	Drive Wheel Swing Bracket	89	3636	Spindle Slide Plate
44	3690	Drive Wheel Mtg. Shaft & Gear	90	3669	Cotter Key

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PARTS LIST-Con't.

Ref. No.	Part No.	Description
91	3724	Record Dropping Lever
92	3907	Compression Spring
93	3723	Main Drive Gear
94	3748	Pick-up Arm Positioning Plate
95	3902	Positioning Plate Guide
96	3792	Positioning Plate Lift Spring
97	2298	Spring Cup
98	3747	Lift Pin Mounting Bracket
99	3741	Pick-up Arm Lateral Lever
100	3738	Pick-up Arm Return Lever Spring
101	3580	Pick-up Arm Return Lever
102	3710	Record Gate Reset Lever
103	3705	Positioning Plate Spring
104	2556	Record Gate Reset Lever Spring
105	3700	Pick-up Arm Actuating Lever
106	3649	Mounting Stud
107	3720	Operating Bar
108	3658	Switch-off Plate
109	3919	Strengthener
110	3706	Auto-stop Lever Mtg. Bracket
111	3599	Auto-stop Lever
112	3707	Auto-stop Catch Plate
113	3691	Muting Switch Mtg. Bracket
114	3585	Lift Pin & Muting Switch Actuating Link
115	3697	Lift Pin & Muting Switch Actuating Lever Assembly
116	3928	Muting Switch Assembly
117	3554	Motor Assembly--Consists of:
118	126	Idler Wheel Mtg. Screw
119	2514	Fibre Washer
120	3199	Idler Wheel
121	3339	Motor Pulley
122	3104	Coupling Spring
123	3395	Motor Mtg. Screw
124	2122	Fan
125	3010	Spindle
126	3254	Idler Swivel Arm
127	1298	Swivel Arm Set Screw
128	3011	Spindle
129	3172	Idler Slide Arm
130	2819	Slide Arm Return Spring
131	800	Slide Arm Set Screw
132	3253	Cam Lever
133	2720	Control Link Mtg. Screw
134	3020	Compression Spring
135	3560	Speed Control Link
136	3406	Thrust Collar
137	3285	Cam Index Roller
138	2995	Speed Control Cam
139	1276	Locknut
140	1251	Hex Nut
141	1613	Index Spring

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CORONADO MODEL TV2-9157A

TRADE NAME	Cornado Models TV2-9157A, TV2-9159A, TV2,-9161A, TV2-'9161A, TV2-9162A
SUPPLIER	Gamble-Skogmo Inc, 15 North 8th Street, Minneapolis, Minn.
TYPE SET	Television Receiver
TUBES	Twenty-Three
POWER SUPPLY	110-120 Volts AC-60 cycle RATING 1. 64 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13VHF, 14 thru 83 UHF, Video IF 45,75 MC, Sound IF 41. 25MC(Intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 13 thru 16
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 10
Resistor Identification 19, 20
Photographs (Cont)
Trans., Inductor & Alignment Identification 17
Resistance Measurements 8
Servicing in the Field 18
Schematic (Alternate Tuner) 10
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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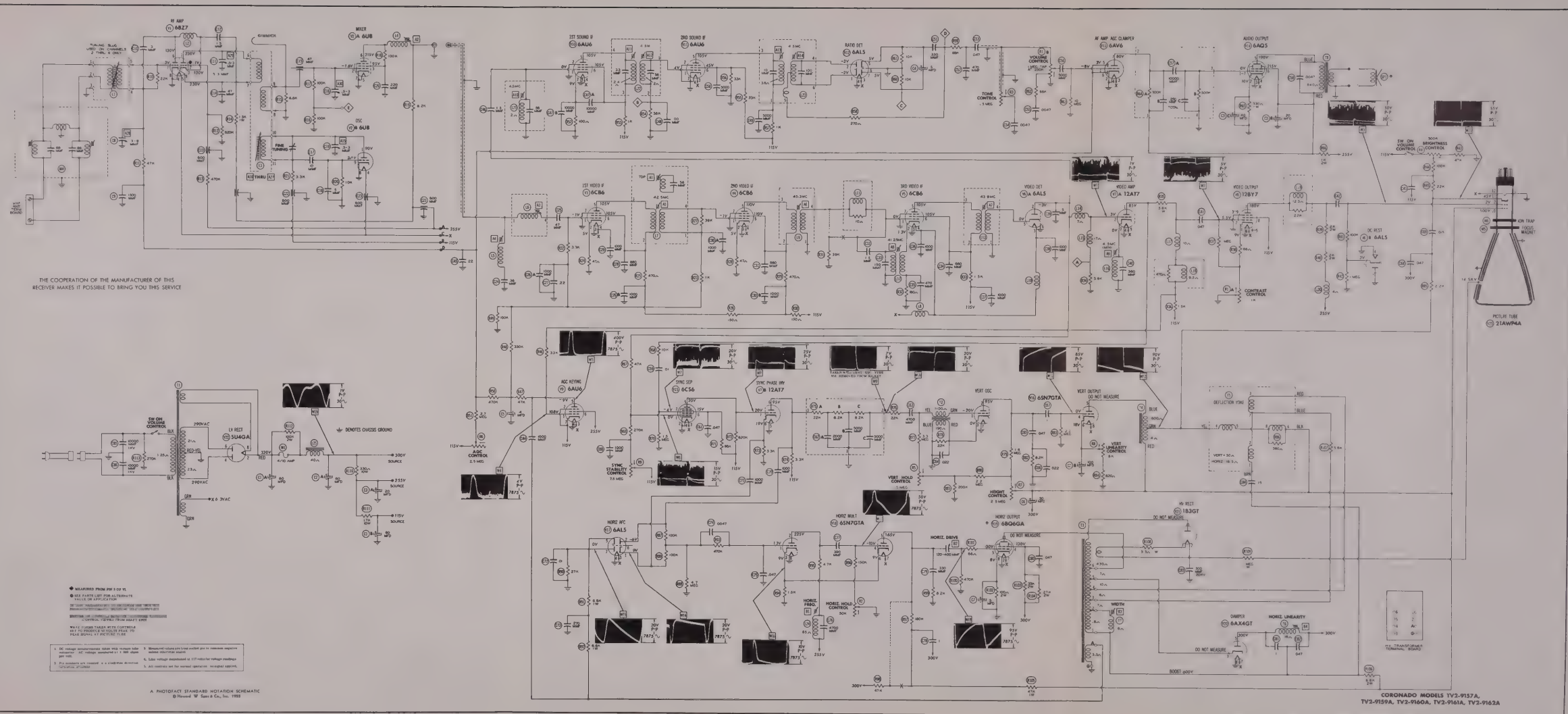
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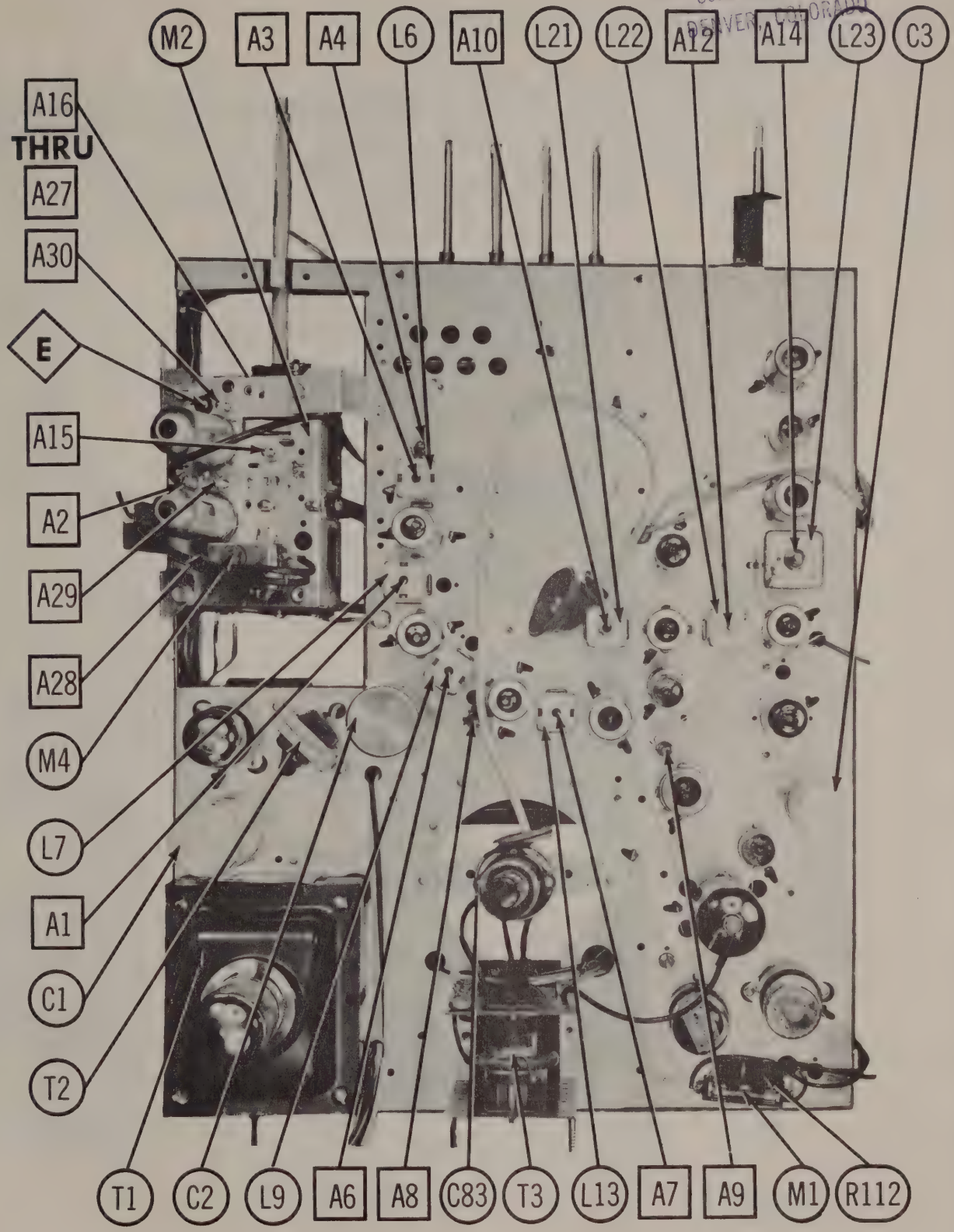
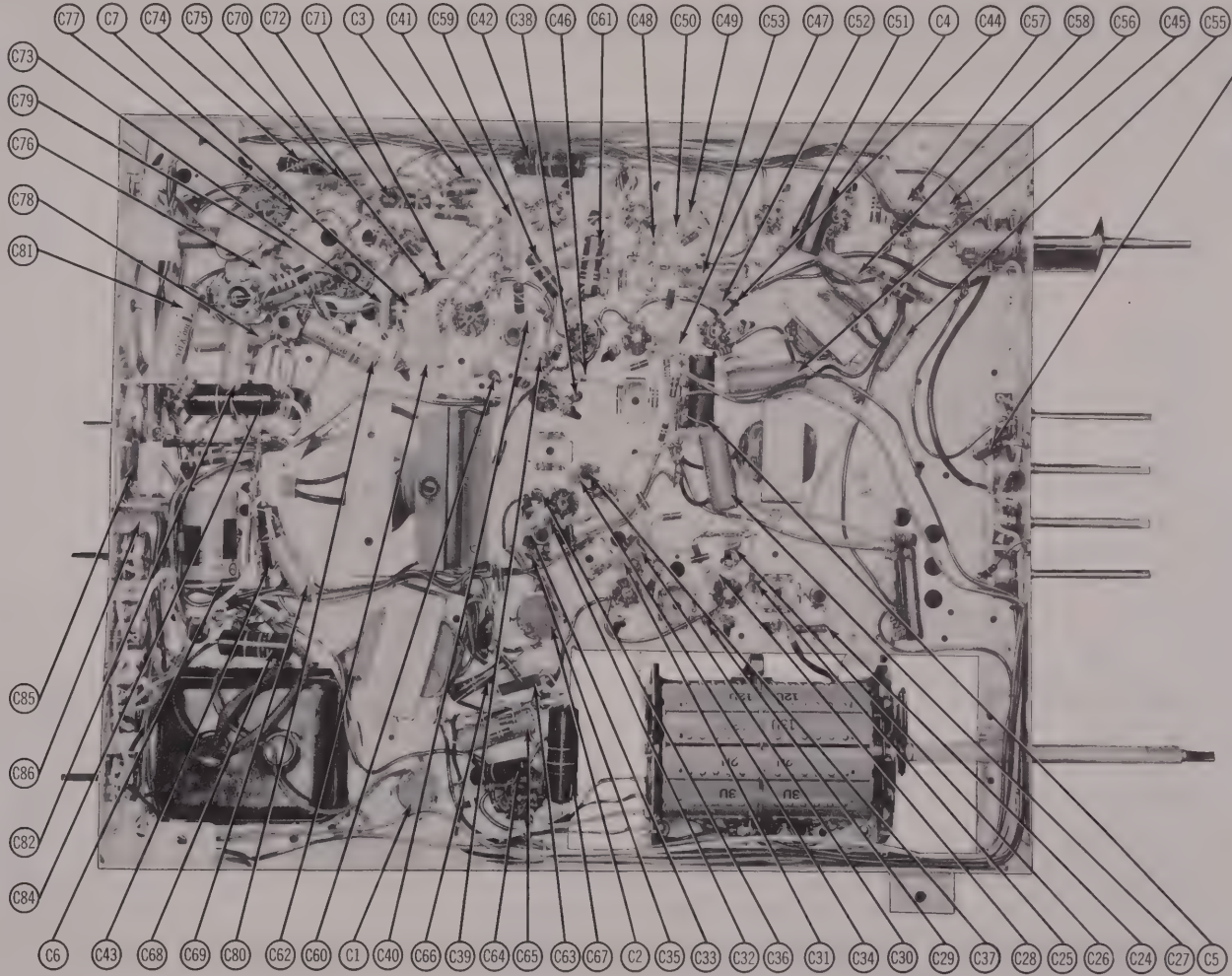


CHASSIS TOP VIEW

SET 285 FOLDER 7



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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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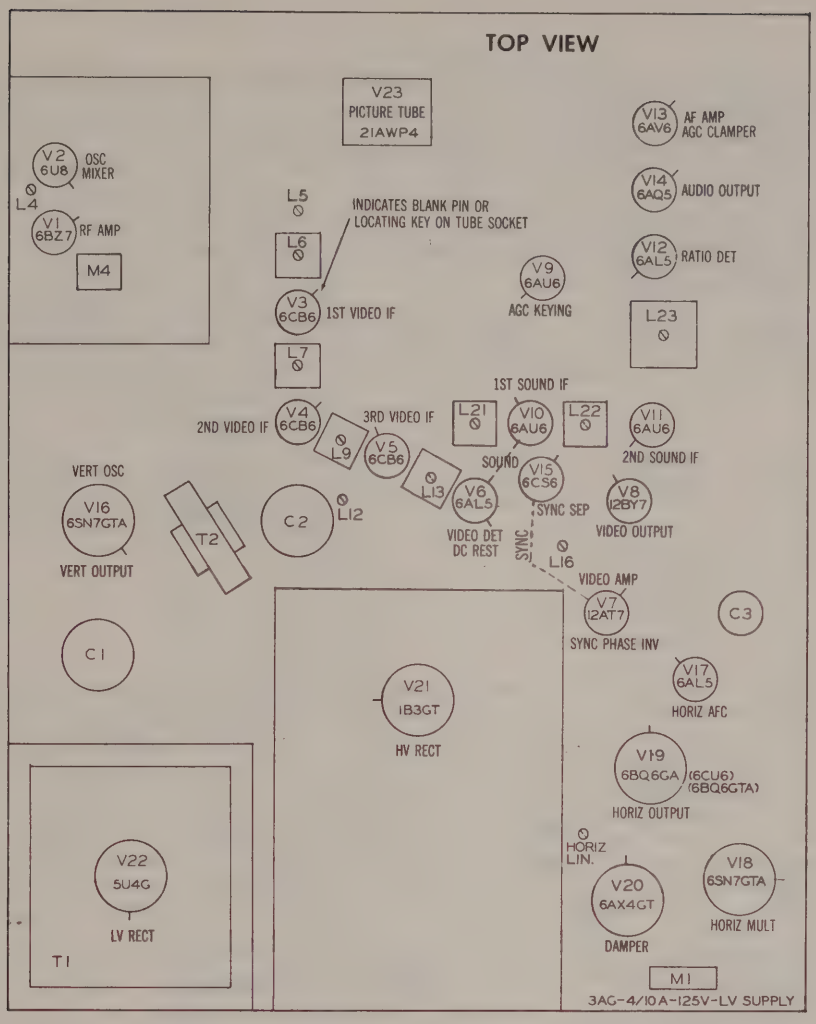
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V8, V9, V23
Has pic, no sound - V10, V11, V12, V13, V14
Overloaded picture - V9, V13

SYNC FAILURE
No vert. sync - V7, V16
No horiz. sync - V7, V17, V18
No vert. or horiz. sync - 7, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V23
No vertical deflection - V16
Poor vert. linearity or foldover - V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22
Vert. off freq. - V7, V16
Horiz. off freq. - V7, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5V battery to the ungrounded side of C27. Connect the positive lead to chassis.
Remove the converter tube (V2) from its socket and replace with a 6U8 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
An alternate method of disabling the local oscillator is to place a piece of transparent tape on the first two contacts from front of drum assembly) of any channel and then switch to the installed strip.
Use only enough generator output to produce usable indication on scope or VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (30MC Swp)	41.25MC 45.75MC 47.25MC	Any	Vert. Amp. thru detector (Fig.1) to pin 5 of 6CB6 (V3). Low side to chassis.	A1, A3, A3, A4	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3 and A4 for response similar to Fig. 2. A2 and A3 affect the flat portion of curve. A4 positions the 41.25MC marker. Make sure 45.75MC marker is on peak of curve as shown or 44.5MC marker on overall response will be incorrect.
2.	"	"	Not used	42.5MC (Unmod)	"	Used VTVM. DC probe to point (A). Common to chassis	A5	Increase bias from 1.5 volts to 4.5 volts at ungrounded side of C27. Attenuate generator output to maintain 1 volt at VTVM. Adjust for maximum deflection.
3.	"	"	"	45.3MC (Unmod)	"	"	A6	"
4.	"	"	"	43.9MC (Unmod)	"	"	A7	"
5.	"	"	"	41.25MC (Unmod)	"	"	A8	"
6.	"	"	44MC (30MC Swp)	41.25MC 42.25MC 43.5MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point A . Low side to chassis.		Check for response curve similar to Fig.3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching , step 1 should be repeated.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	10KΩ	High side thru 10KΩ to pin 3 (plate) of 6AL5 (V6A) . Low side to chassis.	4.5MC (Unmod)	Any	DC probe to pin 2. (grid) of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection.

ALTERNATE 4.5MC TRAP ALIGNMENT

Remove the dummy converter tube and replace the original 6U8 in its socket or remove cellulose tape from tuner strip.
Remove bias supply.
Tune in a TV station and adjust A9 for minimum 4.5MC beat interference in picture.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6CB6 (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 3 (plate) of 6AL5 (V6A) . Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (G) . Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (G) . Common to chassis.	A13	Use only enough signal generator output to provide usable indication on VTVM. Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (D) . Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V5 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V5) from its socket.
Use frequency modulated signal with 80% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 3 (Plate) of 6AL5 (V6A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (D) . Low side to chassis.	A10, A11, A12,	Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
9.	"	"	"	"	"	Vert. Amp. to point (G) . Low side to chassis.	A13	Disconnect stabilizing capacitor C4. Use only enough sweep generator output to provide usable indication on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
10.	"	"	"	"	"	Vert. Amp. to point (D) . Low side to chassis.	A14	Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 5. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

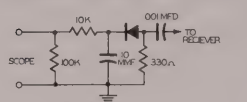


FIG. 1

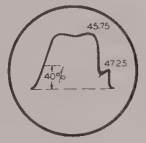


FIG. 2

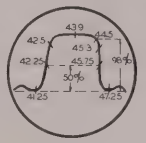


FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt battery to the ungrounded side of C27.
Connect positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency the same amount for a majority of the channels it may be possible to correct them in one step using A15 adjustment. It should be noted that this is an all channel oscillator circuit adjustment, and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within range of the fine tuning control it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency.
The channel oscillator adjustment screws are reached thru a hole just to the left of the channel switch shaft.
The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Remove the dummy converter tube and replace original 6U8 in its socket or remove cellulose tape from tuner strip.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (30MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A) . Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should be at 50%.
			207MC (30MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (30MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (30MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (30MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (30MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (30MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (30MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (30MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (30MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (30MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (30MC Swp)	55.25MC 59.75MC	2		A27	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C45. Connect positive lead to chassis ground.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (30MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (G) . Low side to chassis.	A28, A36, A30	Adjust for response curve similar to Fig.7 with markers above 90%.
13.	"	"	213MC (30MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustment of A28, A29 and A30 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			201MC (30MC Swp)	199.25MC 203.75MC	11			
			195MC (30MC Swp)	193.25MC 197.75MC	10			
			189MC (30MC Swp)	187.25MC 191.75MC	9			
			183MC (30MC Swp)	181.25MC 185.75MC	8			
			177MC (30MC Swp)	175.25MC 179.75MC	7			
			85MC (30MC Swp)	83.25MC 87.75MC	6			
			79MC (30MC Swp)	77.25MC 81.75MC	5			
			69MC (30MC Swp)	67.25MC 71.75MC	4			
			63MC (30MC Swp)	61.25MC 65.75MC	3			
			57MC (30MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

This portion of the set has been properly aligned at the factory.
Alignment of this portion is not recommended in the field.

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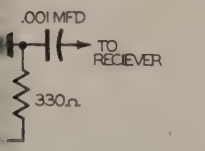


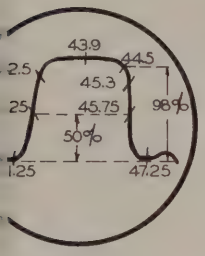


FIG. 3

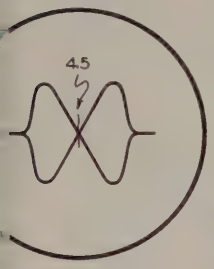


FIG. 5

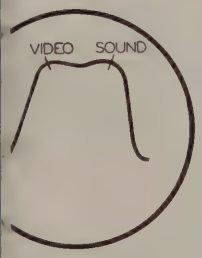


FIG. 7

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt battery to the ungrounded side of C27.
Connect positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency the same amount for a majority of the channels it may be possible to correct them in one step using A15 adjustment. It should be noted that this is an all channel oscillator circuit adjustment, and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within range of the fine tuning control it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency.
The channel oscillator adjustment screws are reached thru a hole just to the left of the channel switch shaft.
The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Remove the dummy converter tube and replace original 6U8 in its socket or remove cellulose tape from tuner strip.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A27	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C45. Connect positive lead to chassis ground.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A28, A29, A30	Adjust for response curve similar to Fig. 7 with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustment of A28, A29 and A30 with channel switch set to that channel. Then recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

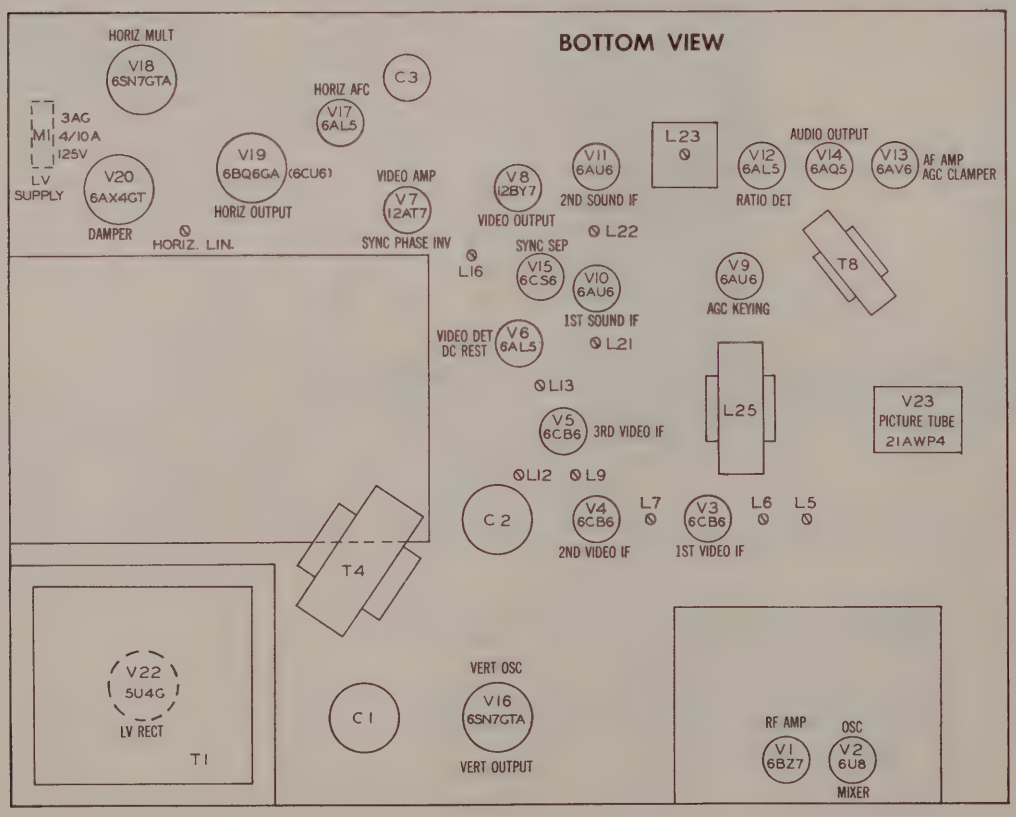
UHF TUNER ALIGNMENT

This portion of the set has been properly aligned at the factory.
Alignment of this portion is not recommended in the field.

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	†1.8KΩ	300KΩ	INF	0Ω	.1Ω	INF	1Meg	0Ω	†1.8KΩ
V 2	6U8	†5.3KΩ	200KΩ	†100KΩ	.1Ω	0Ω	†8.2KΩ	0Ω	0Ω	10KΩ
V 3	6CB6	100KΩ	47Ω	0Ω	.1Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 4	6CB6	100KΩ	47Ω	0Ω	.1Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 5	6CB6	.1Ω	180Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 6	6AL5	1Meg	3.9KΩ	.1Ω	0Ω	.4Ω	0Ω	0Ω		
V 7	12AT7	†9KΩ	3.9KΩ	.2Ω	0Ω	0Ω	†5.3KΩ	†820KΩ	3.3KΩ	.1Ω
V 8	12BY7	450Ω	1Meg	0Ω	.1Ω	.1Ω	0Ω	†4KΩ	†2.1KΩ	0Ω
V 9	6AU6	†36KΩ	†2.1KΩ	.1Ω	0Ω	500KΩ	†400Ω	†2.1KΩ		
V 10	6AU6	2Ω	0Ω	0Ω	.1Ω	†3KΩ	†3KΩ	100Ω		
V 11	6AU6	56KΩ	0Ω	.1Ω	0Ω	†3KΩ	†30KΩ	0Ω		
V 12	6AL5	INF	INF	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 13	6AV6	10Meg	0Ω	.1Ω	0Ω	850KΩ	850KΩ	†500KΩ		
V 14	6AQ5	500KΩ	330Ω	0Ω	.1Ω	†2KΩ	†1.4KΩ	500KΩ		
V 15	6CS6	50KΩ	0Ω	.1Ω	0Ω	†820KΩ	†68KΩ	1.5Meg		
V 16	6SN7GTA	4Meg	▲2.5Meg	190Ω	2.2Meg	▲8.5KΩ	2KΩ	0Ω	.1Ω	
V 17	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	10KΩ	NC	10KΩ		
V 18	6SN7GTA	5Meg	†5KΩ	1.5KΩ	160KΩ	†230KΩ	1.5KΩ	.1Ω	0Ω	
V 19	6BQ6GA	TP	0Ω	TP	†15KΩ	470KΩ	TP	.1Ω	100Ω	Top Cap ▲17Ω
V 20	6AX4GT	TP	NC	150KΩ	TP	†65Ω	NC	.1Ω	0Ω	
V 21	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ▲450Ω
V 22	5U4GA	INF	50KΩ	INF	23Ω	INF	2Ω	INF	50KΩ	
V 23	21AWP4	0Ω	1Meg	Pin 10 ▲6.8KΩ	Pin 11 †250KΩ	Pin 12 .1Ω				

† MEASURED FROM PIN 2 OF V22.
▲ MEASURED FROM PIN 3 OF V20.
TP - TIE POINT
NC - NO CONNECTION



TUBE PLACEMENT CHART

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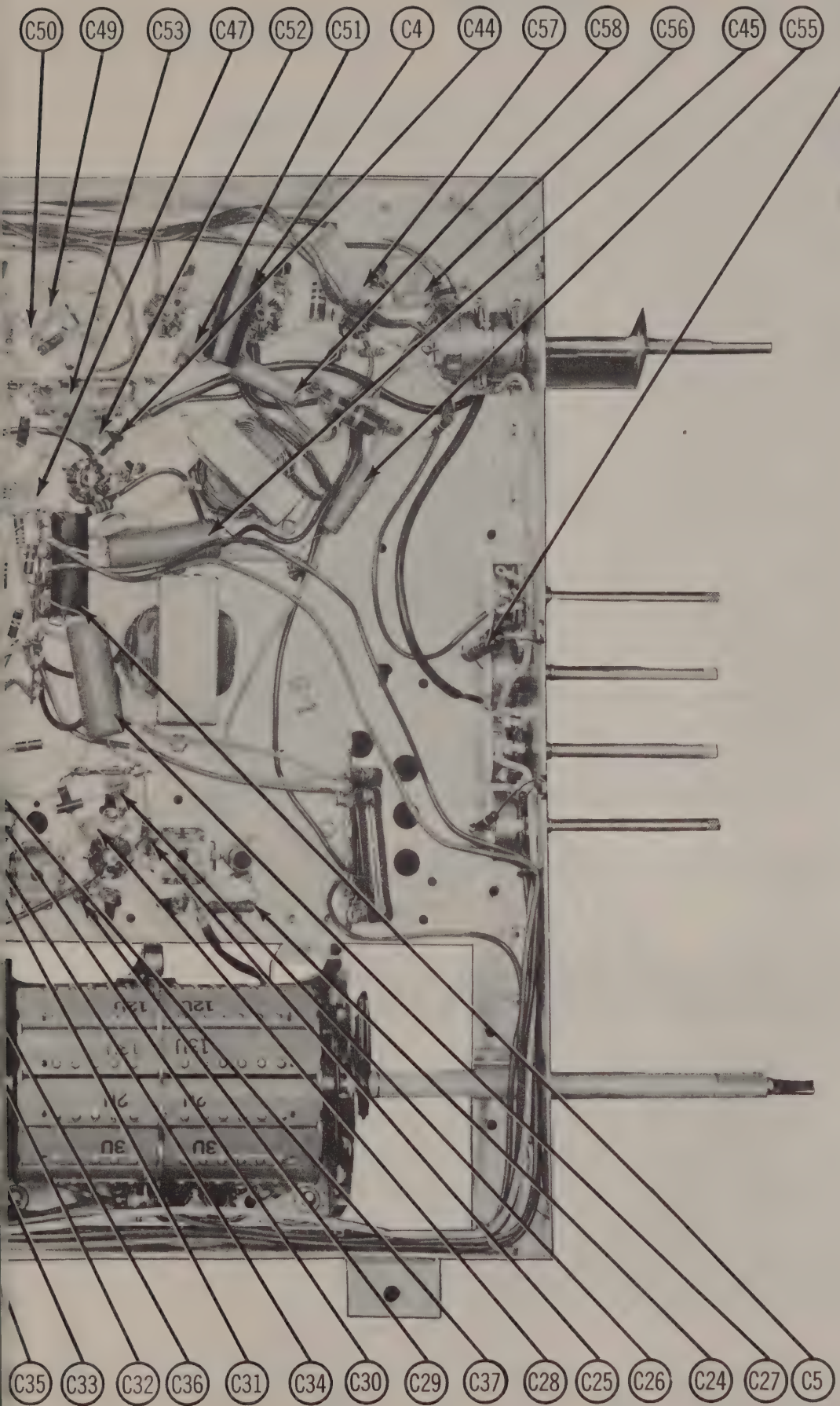
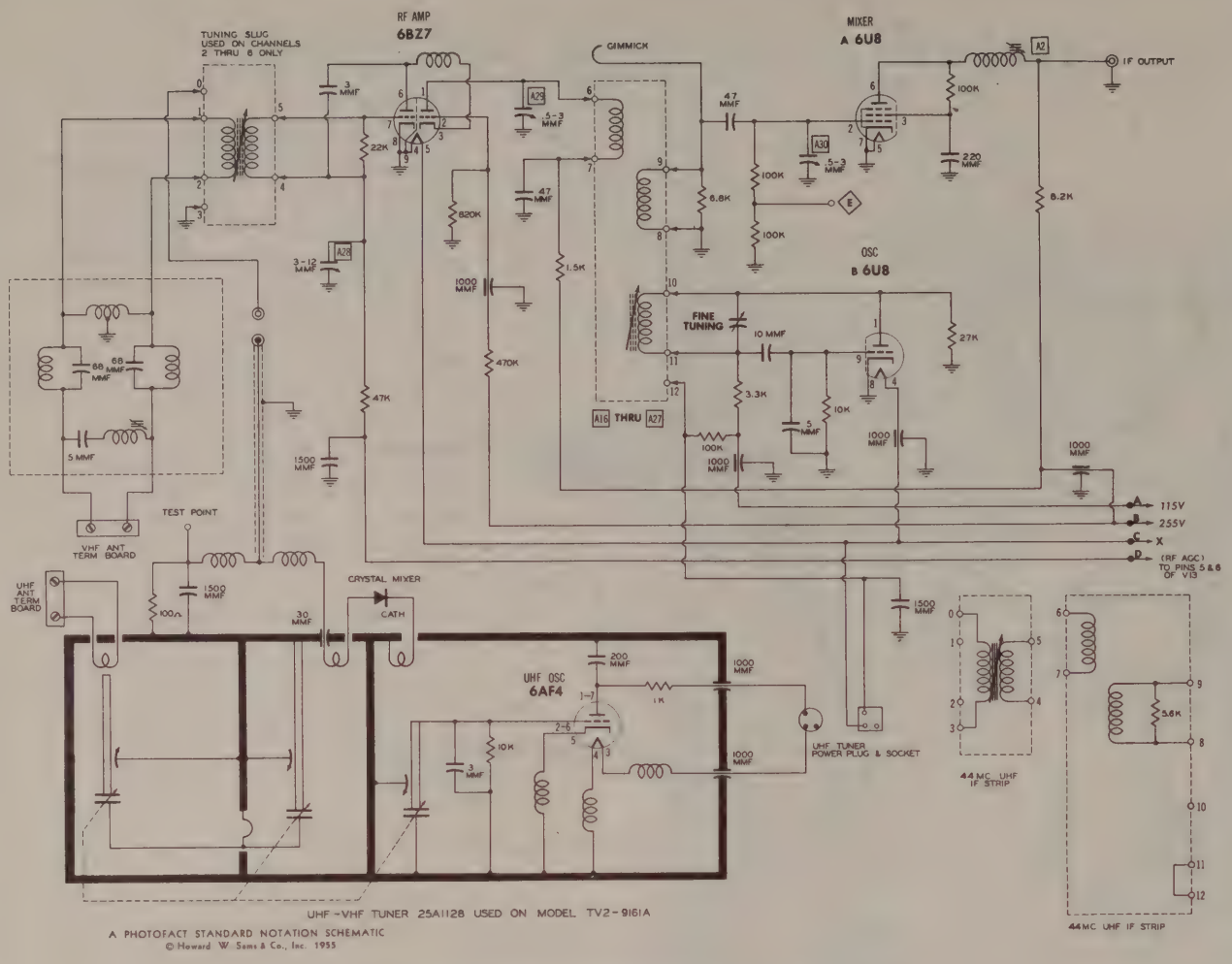
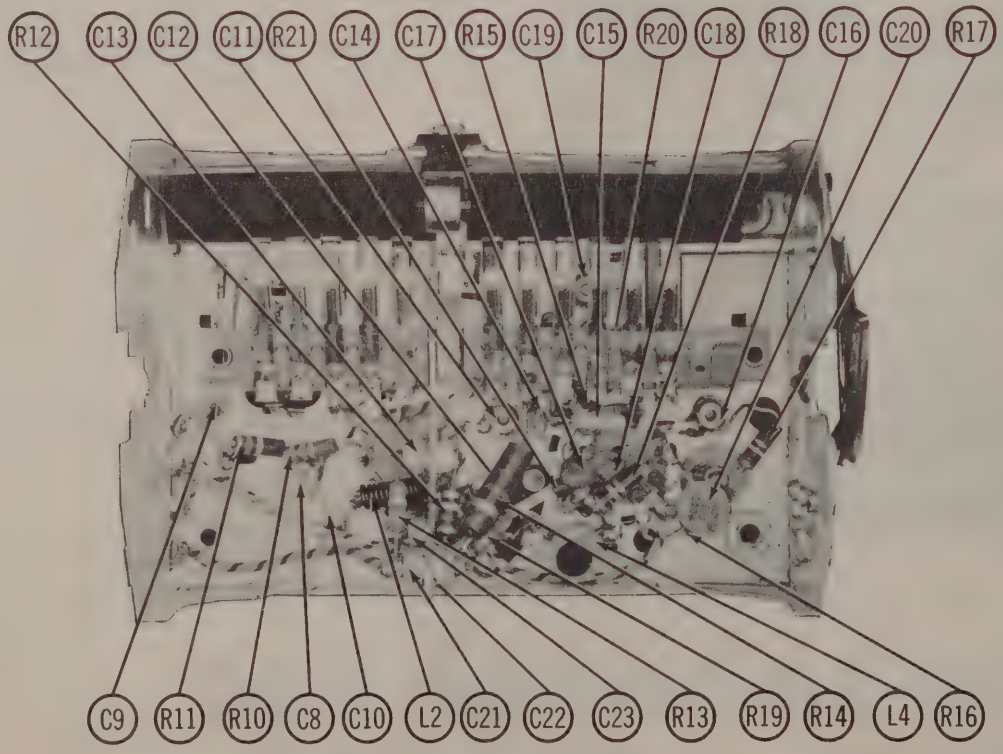


APACITOR IDENTIFICATION



ALTERNATE TUNER SCHEMATIC



RF TUNER-BOTTOM VIEW

F
...NSHIP
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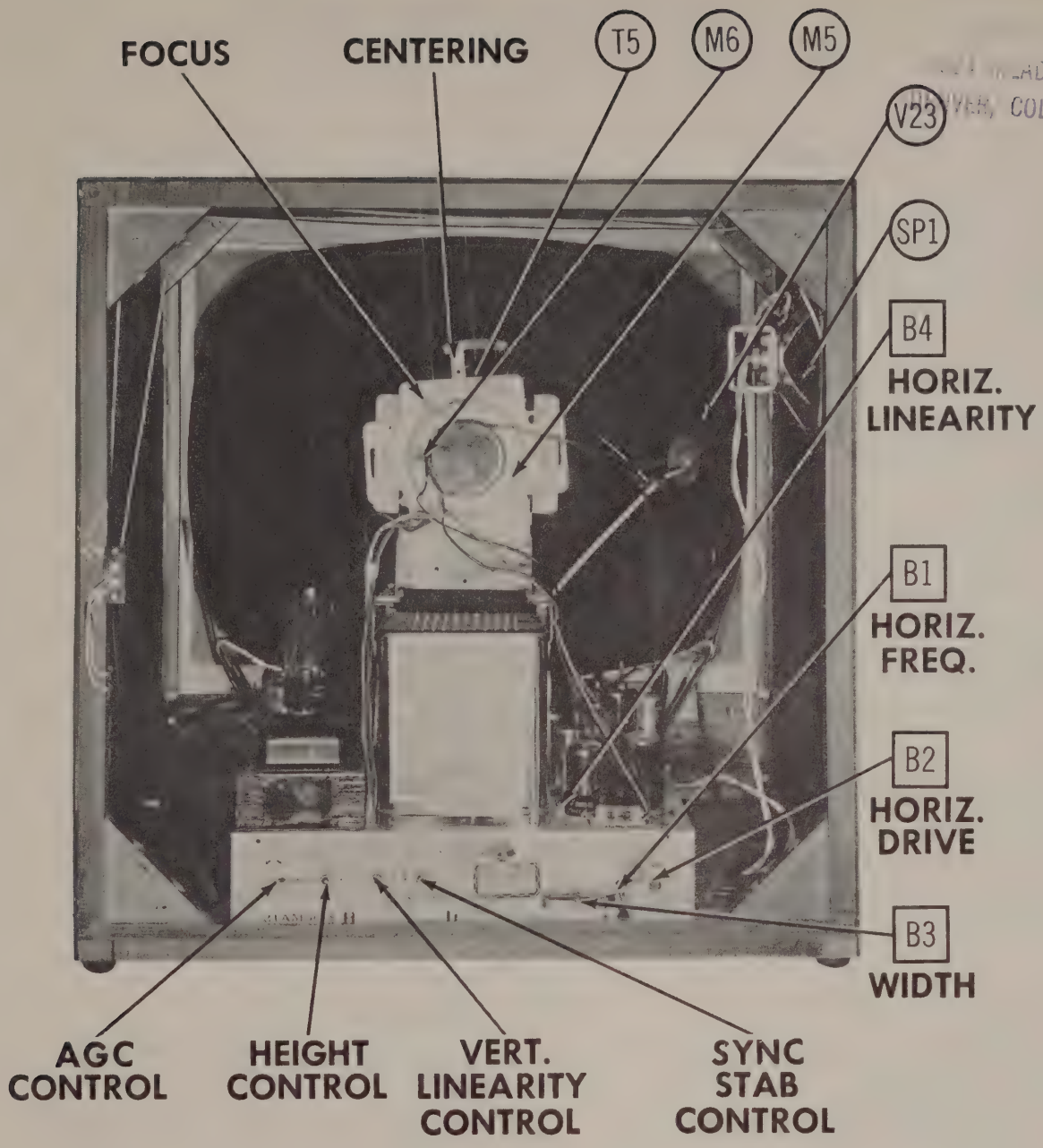

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably a test pattern.

IF horizontal hold control fails to maintain sync, set it in the middle of its range and adjust the horizontal frequency slug (B1) until the picture is in sync. Check other channels and if necessary readjust B1 slightly for best sync on all channels. With picture locked in sync turn contrast control to minimum contrast and adjust brightness control for a washed out picture. Adjust the width control (B3) for a picture slightly wider than necessary to fill the mask horizontally.

Turn the horizontal drive timmer (B2) inward (if necessary) until horizontal drive line disappears.

Adjust the horizontal linearity control (B4) for a picture that is symmetrical from left to right.

Adjust the picture centering device located in front of focus magnet to center picture in the mask.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss Of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20 and V22. Check adjustments B2, B3 and B4. Check T3, T5A, R103, R104, R99, C79, C7 and other associated components.

DRIVE LINES

Check by substitution V19 and V20. Check adjustments B2 and B4. Check R103, R104 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V18, V19 and V20. Check C75 for open. Check L24, C76, R94 and other associated components.

XMAS TREE EFFECT

Check by substitution V18, V19 and V20. Check T3 and T5 for internal arcing. Check C72, C74, C76, C77, L24, R90, R95 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V16. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R8, R84 and other associated components.	Check T2, R77, R79, R106, R7, C64, C67 and other associated components.

INSUFFICIENT SWEEP

Substitute V16. Check height and vertical linearity controls for proper operation. Check R79, T4 and other associated components.

COMPRESSED AT BOTTOM

Substitute V16. Check R79, R80, R106, R7, C67 and other associated components.

COMPRESSED AT TOP

Substitute V16. Check R8, R84, C2B, C67, T4 and other associated components.

FOLDS

Substitute V16. Check C65, C66, C67, R82, T4, T5B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V15 and V7. Check C59, C61, R71, R72, R74 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V16. Check vertical integrator network. Check C63, C64, R78, R77, R5, T2 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check C70, C71, C76, L24, R95 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V15, V17 and V18. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V7 and V8. Check R35, R36, R39, R40, C41, C42, L20, L17 and other associated components.

SOUND BARS(4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check Video IF Alignment.

POOR CONTRAST

Check by substitution V7 and V8. Check contrast control. Check L18, L19, C41, C42 and other associated components.

NEGATIVE PICTURE

Check by substitution V7 and V8. Check picture tube. Check C41, C42, R38 and other associated components.

SMEAR

Check by substitution V7 and V8. Check L14, L15, L18, L19, C41, C42 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V10, V11, V12, V13 and V14. Check stages V13 and V14 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C53, C56, C57, C58, C3B, C3C, R66, R65, R64, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A14 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak Or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, substitute V22. Check M1 fuse. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V22. Check B+ filter and decoupling network.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CORONADO PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Mixer-Osc.	6U8	6U8	9AE	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Det.- DC Restorer	6AL5	6AL5	6BT	
V7	Video Amp.- Sync Phase Inv.	12AT7	12AT7	9A	
V8	Video Output	12BY7	12BY7	9BF	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V11	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Det.	6AL5	6AL5	6BT	
V13	AF Amplifier- AGC Clamper	6AV6	6AV6	7BT	
V14	Audio Output	6AQ5	6AQ5	7BZ	
V15	Sync Separator	6CS6	6CS6	7CH	
V16	Vert. Oscillator- Vert. Output	6SN7GTA	6SN7GTA	8BD	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BQ6GA	6BQ6GA	6AM	6CU6, 6BQ6TA used as alternate
V20	Damper	6AX4GT	6AX4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4GA	5U4GA	5T	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	CORONADO PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V23	21AWP4 ①	21AWP4 ①	21AWP4 ①	21AWP4 ②	21AWP4 ①	12N	① Aluminized ② Silver Screen

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	CORONADO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▰80	400	45X390			FP229.4	TM-D80-450	T-180	
B	▲60	400							
C2A	▰80	400	45X391			FP229.8	TM-3057	T-720	
B	▲100	50							
C3A	■20	400	45X392			FP234	TM-D20-450	D-215	
B	▲20	400				TC39	TD-50-50	FM-0550	
C	40	50							
C4	5	25				TC30	TD-5-25	MMT-0505	
C5	4	100	45X361			TC40	TD-4-150	FM-1504	
C6	30	400				TC77	TD-30-450	FM-4530	
C7	5	25				TC30	TD-5-25	MMT-0505	
C8	3-9		31A-079	829-10					
C9	1500			DD-152	801-0015	DC-5215			
C10	3		13L-8C030K	TCZ-3R3	NP0A-030	ZT-5533			
C11	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A			
C12	1.5		13L-8C1R5C	TCZ-1R5	NP0A-1R5	ZT-5515			
C13	800								
C14	47		13L-8Q470K	DD-470	831-470	UC-5447			
C15	47		13M-20U470K-R	MFT-50					
C16	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A			
C17	10		13L-8T100A	TCN-10	N750K-100	NT-541			
C18	5		13L-8UA050C						
C19	.5-3		31A-056-1	829-3	3115-01-0R5	CT565A			
C20	220		13L-12D221K	DD-221	811-221	UC-5322			
C21	800								
C22	800								
C23	800								
C24	36		47X626						
C25	47			D6-470	GP1K-470	UC-5447		K-1447	
C26A	1000			DD2-102	812-001	DCD-521		K-1210	
B	1000							K-1210	
C27	.22	200	RCP10M2224M			PT4022	IMP4-P22	3304022	
C28	680			DD-681	811-681	UC-5368		K-1368	
C29	1000			DD-102	801-001	DC-521		K-1210	
C30A	1000			DD2-102	812-001	DCD-521		K-1210	
B	1000							K-1210	
C31	680			DD-681	811-681	UC-5368		K-1368	
C32	1.5			TCZ-1R5	NP0A-1R5	ZT-5515			
C33	150	500	RCM15E151K	D6-151	811-151	MCB236		KR-1315	
C34	680			DD-681	811-681	UC-5368		K-1368	
C35	470		80X4	DD-471	831-471	UC-5347		K-1347	
C36	1000			DD-102	801-001	DC-521		K-1210	
C37	1000			DD-102	801-001	DC-521		K-1210	
C38	1000			DD-102	801-001	DC-521		K-1210	
C39	5		47X562	TCZ-4R7	NP0A-050	ZT-555		KR-1550	
C40	360	500	47X568		811-361			KR-1336	
C41	.047	400		DF-503		PT4147	IMP4-S47	3304147	
C42	.1	400		DF-104		PT401	IMP4-P1	330401	
C43	.1	200		DF-104		PT401	IMP2-P1	330201	
C44	1000			DD-102	801-001	DC-521	IMP6-D1	K-1210	
C45	.22	200	RCP10M2224M			PT4022	IMP4-P22	3304022	
C46	1.5			TCZ-1R5	NP0A-1R5	ZT-5515			
C47A	10000		80X6	DD3-103	811-01	DC-511			
B	10000				811-01	DC-511			
C48	100			D6-101	GP1K-101	UC-531		K-1310	
C49	5000			DD-502	811-005	DC-525		C-1250	
C50	5000			DD-502	811-005	DC-525		C-1250	
C51	330	500	47X570	D6-331	811-331	UC-5333		K-1333	
C52	470	500	47X525	D6-471	GP2K-471	MC245		K-1347	
C53	.047	200		DF-503		PT4147	IMP2-S47	3302147	
C54	.0047	400		D6-472	GP2-333-472	PT6247	IMP6-D47	3306247	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	CORONADO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C55	.0047	400		D6-472	GP2-333-472	PT6247	IMPE-D47	3306247	
C56	5000			DD-502	81J-005	DC-525	IMPE-D5	C-1250	
C57A	10000								
B	250		†76X5	†PC-80	†14404-01				
C									
C58	.0047	600		D6-472	GP2-333-472	PT6247	IMPE-D47	3306247	
C59	.01	400		D6-103	GP2-333-103	PT411	IMP4-81	330411	
C60	1000			DD-102	801-001	DC-531		K-1210	
C61	.047	400		DF-503		PT4147	IMP4-847	3304147	
C62A	2000					DC-532	IMP6-D2	C-1230	
B	3900		†76X7	‡PC-100	‡1405-01	DC-531	IMP6-D3	C-1240	
C	5000					DC-528	IMP6-D5	C-1250	
C63	.4700	500	47X543			MC2465		CM-1247	
C64	.022	200		DF-203	81T-03	PT4123	IMP4-823	3304122	
C65	.047	600		DF-503		PT6147	IMP4-847	3306147	
C66	.022	200		DF-203	81T-02	PT4122	IMP4-822	3304122	
C67	1	600		DF-104		PT601	IMP6-P1	330601	
C68	.047	600		DF-503		PT6147	IMP6-847	3306147	
C69	015	600	RCP10M6153M	DD16-153		PT6115	IMP6-S15	3306115	
C70	1000			DD-102	801-001	DC-531	IMP6-D1	K-1210	
C71	1000			DD-102	801-001	DC-531	IMP6-D1	K-1210	
C72	01	400		D6-103	GP2-333-103	PT411	IMP4-81	330411	
C73	270	500		D6-271	81J-271	MC2441		K-1327	
C74	.0047	400		D6-472	GP2-333-472	PT6247	IMP6-D47	3306247	
C75	.047	200		DF-503		PT4147	IMP4-847	3302147	
C76	.4700	500	47X543			MC2465		CM-1247	
C77	390	500	RCM39B391J	D6-391	81J-391	MC2543		KM-1339	
C78	1	400		DF-104		PT601	IMP4-P1	330401	
C79	330	500	47X970	D6-331	81J-331			KM-1333	
C80	.047	400		DF-503		PT4147	IMP4-847	3304147	
C81	1	400		DF-104		PT601	IMP4-P1	330401	
C82	.047	400		DF-503		PT4147	IMP4-847	3304147	
C83	500	20000	47X569	TV3-503	413	HV20035A			
C84	15	400	RCP10M4154M			PT4015	IMP4-P15	330405	
C85	10000	1000		DD-103					
C86	10000	1000		DD-103					

† Items C57A, C57B, C57C, R64A, R64B are combined in one unit.
When replacing items separately C57B and C57C should total 250MMF.
‡ Items C62A, C62B, C62C, R57A, R75B and R75C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	CORONADO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	B76X21	*QJ-636	RTV-502	F1-4	U31L	Constant - Panel
B	1Meg	½				R2-59	UR45-T354	Volume (taped at 250KΩ - Rear
C	Switch					KS-3	U8-27	Attach to R1B
R2A	50KΩ	½	B40X381-C	QU-123	A47-50K-S	A3-31	U-35	Horiz. Hold
B	Shaft		Not Req.	NQ	R8-3/16	AK-4	Not Req.	Attach to R2A
R3A	1. 5Meg	½	B40X334-E	QU-130	A47-1.5Meg-S	A3-75	U-156	Tone
B	Shaft		Not Req.	NQ	R8-3/16	AK-4	Not Req.	Attach to R3A
R4A	500KΩ	½	B40X323-A	QU-123	A47-500K-S	A3-59	U-50	Brightness
B	Shaft		Not Req.	NQ	R8-3/16	AK-5	Not Req.	Attach to R4A
R5A	1. 5Meg	½	B40X334-E	QU-138	A47-1.5Meg-S	A3-75	U-156	Vert. Hold
B	Shaft		Not Req.	NQ	R8-3/16	AK-4	Not Req.	Attach to R5A
R6A	2. 5Meg	½	B40X369-A	QU-239	A47-2.5Meg-S	A3-83	SU-569	AGC
B	Shaft		Not Req.	RQ	FK8-1/4	AK-1	Not Req.	Attach to R6A
R7A	2. 5Meg	½	B40X369-A	QU-239	A47-2.5Meg-S	A3-83	SU-565	Height
B	Shaft		Not Req.	RQ	FK8-1/4	AK-1	Not Req.	Attach to R7A
R8A	8000Ω	½	B40X375	QU-116	A47-10K-S	A3-14	SU-50	Vert. Linearity
B	Shaft		Not Req.	RQ	FK8-1/4	AK-1	Not Req.	Attach to R8A
R9A	7. 5Meg	½	B40X370-A	QU-142	A47-7.5Meg-S	A3-89	U-53	Sync Stability
B	Shaft		Not Req.	RQ	FK8-1/4	AK-4	Not Req.	Attach to R9A

* CONCENTRIKIT EQUIVALENT: KIT K-4, BASE ELEMENTS & SHAFTS: BU-109 & PE-216 (PANEL)
B13-137X & R16-113 (REAR)
76-2 SWITCH

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	CORONADO PART No.	IRC PART No.	NOTES
R10	22KΩ	½	12T-AE223K	BTS-22K	
R11	47KΩ	½	12T-AE473M	BTS-47K	
R12	820KΩ	½	12T-AE824T	BTS-820K	
R13	470KΩ	½	12T-AE474K	BTS-470K	
R14	1500Ω	1	12S-AE152K	BTA-1500	
R15	6800Ω	½	12T-AE682K	BTS-6800	
R16	100KΩ	½	12T-AE104K	BTS-100K	
R17	100KΩ	½	12T-AE104K	BTS-100K	
R18	100KΩ	½	12T-AE104K	BTS-100K	
R19	8200Ω 5%	½	12T-AE822K	BTS-8200 5%	
R20	10KΩ	½	12T-AE103M	BTS-10K	
R21	3300Ω	½		BTS-3300	
R22	33000Ω 5%	½		BTS-3300 5%	
R23	1000Ω	½		BTS-1000	
R24	470Ω 5%	½		BTS-47 5%	
R25	470Ω	½		BTS-470	
R26	180Ω	½		BTS-180	
R27	39KΩ 5%	½		BTS-39K 5%	
R28	47Ω 5%	½		BTS-47 5%	
R29	470Ω	½		BTS-470	
R30	150Ω	½		BTS-150	
R31	39KΩ 5%	½		BTS-39K 5%	
R32	180Ω	½		BTS-180	
R33	1500Ω	½		BTS-1500	
R34	3900Ω	½		BTS-3900	
R35	5600Ω	1		BTA-5600	
R36	1500Ω	½		BTS-1500	
R37	1Meg	½		BTS-1Meg	
R38	68Ω	½		BTS-68	
R39	30000Ω 5%	2	D63202	BTB-3000 5%	
R40	30000Ω 5%	2	D63202	BTB-3000 5%	

ITEM No.	RATING OHMS	RATING WATT	CORONADO PART No.	IRC PART No.	NOTES
R41	100KΩ	½		BTS-100K	
R42	1Meg	½		BTS-1Meg	
R43	47KΩ	½		BTS-47K	
R44	100KΩ	½		BTS-100K	
R45	22KΩ	½		BTS-22K	
R46	33KΩ	½		BTS-33K	
R47	47KΩ	½		BTS-47K	
R48	330KΩ 5%	½		BTS-330K 5%	
R49	100KΩ	½		BTS-100K	
R50	470KΩ	½		BTS-470K	
R51	2. 7Meg	½		BTS-2.7Meg	
R52	100Ω	½		BTS-100	
R53	1000Ω	½		BTS-1000	
R54	56KΩ	½		BTS-56K	
R55	33KΩ	½		BTS-33K	
R56	33KΩ	½		BTS-33K	
R57	1000Ω	½		BTS-1000	
R58	270Ω	½		BTS-270	
R59	68KΩ	½		BTS-68K	
R60	10KΩ 5%	½		BTS-10K 5%	
R61	10KΩ 5%	½		BTS-10K 5%	
R62	68KΩ	½		BTS-68K	
R63	10Meg	½		BTS-10Meg	
R64A	500KΩ	½		BTS-470K	
B	500KΩ	½		BTS-470K	
R65	330Ω	1		BTA-330	
R66	1000Ω	2		BTB-1000	
R67	47KΩ	½		BTS-47K	
R68	10KΩ	½		BTS-10K	
R69	2700Ω	3		BTB-2700	
R70	1. 5Meg	½		BTS-1.5Meg	

† Items R64A, R64B, C57A, C57B and C57C are combined in one unit.
‡ Items R75A, R75B, R75C, C62A, C62B and C62C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	CORONADO PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117VAC	560VCT	5VAC	53X339B		P-2638 ②				
	① 1. 8A	. 270ADC	③ 3A							
		SEC. 3	SEC. 4	SEC. 5						
	6. 3VAC									
	④ 6. 4A									

① Parallel and phase 6.3V ④ 5.8A winding for Sec. #3.
② Tape other two 6.3V windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	CORONADO PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No	Stancor PART No.	Thordarson PART No	Triad PART No
T2	Vert. Osc. Trans.	54X10	B6702	A-3003	209T1 ①	V405	A-8125	26A03	A-97X
T3	Horiz. Output Trans.	53X346	P3611 ② RF800 ①	RVO-9 & MWC-1* ①	212T1 ① 212R1 * ①	X110 *	A-8252 & WC-5 *①	FLY-37 *	D-35 & WC-12 * ①
T4	Vert. Output Trans.	51X168	Z1806 ①	A-3039 ①	226T1 ①	V312 ①	A-8141 ①	26B54 ①	A-1043 ①
T5A	Yoke-Horiz. (13. 5MH)	9A2334-1 ②	DF802 ①	MDF-72 ①	211D5 ①	Y70P14 ①	DY-9A ①	Y-4 ①	Y-17 ①
B	Vert. (45MH)								
T6	Horiz. Lin. Coil (1. 1-6. 5MH)	9A2323	RF800 ①	MWC-6 ①	213R1	20R15	WC-8	WC-22	WC-13 ①
T7	Width Coil (1. 1-6MH)	9A2183			203R4 ①	20R4 ①	WC-4 ①	WC-15 ①	

① Drill new mounting hole(s).
② Includes resistor R86.
③ Use original yoke damping network.
④ Enlarge mounting hole.
⑤ Connect to terminals #3 and #6.
⑥ Connect to coded blue and green terminals.
⑦ Use original slider, clip and core.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	6	9	9	10	13	9	13	10
	5	8	8	8	Jumper 10 & 11	Jumper 8 & 7	Jumper 10 & 11	8
	4	5	5	7	6	5	6	7
	3	See Note ⑤	See Note ⑤	See Note ⑤	5 or 4	See Note ⑤	5 or 4	See Note ⑤
	2	T	T	NC	2	3	2	NC
	1	1	1	3	1	1	1	2
	A	Term. #3 of RF800	Orange Term. of MWC-1	2	9	Red Term. of WC-5	9	2
	C	Term. #4 of RF800	Black Term. of MWC-1	1	8	Blue Term. of WC-5	8	1
Connect Width Coil Across		2 & 1	Term #1 & #2 of RF800 Across "T" & 1	Red & Blue terms of MWC-1 across "T" & 1	212R1 across 2 & 1	2 & 1	Orange & black term. of WC-5 across 3 & 1	2 & 1	Red & blue terms of WC-12 across 2 & 1
Special Note:		⑤ ⑥	⑤ ⑥	⑤		⑤ ⑦		⑤ ⑦

① Connect a 47MMF or 56MMF capacitor from open end of R107 (orig. term. #3 connection) to term. #3 of yoke (red lead).
② If the picture is out of phase, reverse width coil primary or secondary.
③ Jumper terms. #9 and "T".

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	CORONADO PART No.	Halldorson PART No	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T6	6. 5KΩ	3. 7Ω	51X168	Z1D7	A-2930	A-2877	24B51	S-3X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	CORONADO PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3. 7Ω	12A516	6A2I	① Used in console models
	10"	PM	3. 7Ω	12A519 ①	10A2I	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC	CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0Ω	0Ω	9A2330-2				Channel 2
B	Ant. Coil	0Ω	0Ω	9A2330-3				Channel 3
C	Ant. Coil	0Ω	0Ω	9A2330-4				Channel 4
D	Ant. Coil	0Ω	0Ω	9A2330-5				Channel 5
E	Ant. Coil	0Ω	0Ω	9A2330-6				Channel 6
F	Ant. Coil	0Ω	0Ω	9A2330-7				Channel 7
G	Ant. Coil	0Ω	0Ω	9A2330-8				Channel 8
H	Ant. Coil	0Ω	0Ω	9A2330-9				Channel 9
I	Ant. Coil	0Ω	0Ω	9A2330-10				Channel 10
J	Ant. Coil	0Ω	0Ω	9A2330-11				Channel 11
K	Ant. Coil	0Ω	0Ω	9A2330-12				Channel 12
L	Ant. Coil	0Ω	0Ω	9A2330-13				Channel 13
L2	Mout. Coil	0Ω		31D-727				
L3A	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-2				Channel 2
B	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-3				Channel 3
C	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-4				Channel 4
D	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-5				Channel 5
E	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-6				Channel 6
F	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-7				Channel 7
G	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-8				Channel 8
H	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-9				Channel 9
I	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-10				Channel 10
J	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-11				Channel 11
K	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-12				Channel 12
L	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-13				Channel 13
L4	Conv. Plate	.1Ω		31K-109				
L5	IF Trap	.1Ω		9A2320	17-4532 *		TV-120 *	6219 *
L6	1st. Video IF	0Ω		9A2316	17-5001		TV-135 *	6331
L7	2nd. Video IF	.1Ω	.1Ω	9A2317	17-5002		TV-138	6318 ■
L8	Fil. Choke	0Ω		9A2033	19-1002			4006
L9	3rd. Video IF	.1Ω	.1Ω	9A2318	17-5001		TV-138 ▲	6333 ▲
L10	Fil. Choke	0Ω		9A2033	19-1002			4006
L11	Parasitic Suppressor	0Ω		9A2322				2. 2 Microhenries 1 turn wire-wound on 10KΩ resistor
L12	Cathode Trap	0Ω		9A2321				
L13	4th. Video IF	.4Ω	.4Ω	9A2319	17-5004		TV-135	6334
L14	Series Peaking Coil	7Ω		36A10	19-3075			6175
L15	Shunt Peaking Coil	17Ω		36A23	19-3300		TV-135	6155
L16	4. 5MC Trap	.3Ω		9A2074	30-1004		TV-131	1689
L17	Shunt Peaking Coil	10Ω		36A1	19-3100		TV-131	6177
L18	Shunt Peaking Coil	9. 5Ω		36A25	19-3100 ●		TV-131 ●	6177 ●
L19	Series Peaking Coil	12. 5Ω		36A13	19-4180		TV-134 ▲	6180 ▲
L20	Shunt Peaking Coil	14Ω		36A3	19-4302		TV-134	6154
L21	1st. Sound IF	3Ω		9A2301	17-1031 ■		TV-133 *	6303 *
L22	2nd. Sound IF	3. 4Ω	3Ω	9A2323	17-1031		TV-133	6303
L23	Ratio Det.	3. 6Ω	.5ΩCT	9A2325	17-2497		TV-135	6305
L24	Horiz. Osc.	85Ω		9A2096	19-1870		TV-163	6310

* Use one winding only.
■ Drill mounting holes.
▲ Detune trap.
● Parallel with 470Ω resistor.
▬ Parallel with 22KΩ resistor.

CORONADO MODELS TV2-9157A, TV2-9159A, TV2-9160A, TV2-9161A, TV2-9162A

DENVER, COLORADO.

TIONS (Continued)

(cont)

RATING		REPLACEMENT DATA		NOTES
OHMS	WATT	CORONADO PART No.	IRC PART No.	
6800Ω	1		BTA-6800	
470KΩ	½		BTS-470K	
1500Ω 5%	½		BTS-1500 5%	
4700Ω 5%	½		BTS-4700 5%	
150KΩ	½		BTS-150K	
180KΩ	½		BTS-180K	
47KΩ	½		BTS-47K	
8200Ω	½		BTS-8200	
470KΩ	½		BTS-470K	
68Ω	½		BTS-68Ω	
100Ω	2			
33KΩ	2		BTB-33K	
27KΩ	2		BTB-27K	
47KΩ	1		BTA-47K	
6800Ω	2		BTB-6800	
5600Ω	½		BTS-5600	
3.3Ω	1	43X238		
1Meg	1		BTA-1Meg	
330Ω	10	43X273		
1700Ω	10	43X285		
100KΩ	2		BTB-100K	
270KΩ	½		BTS-270K	

are combined in one unit.
C62C are combined in one unit.

OWER)

PLACEMENT DATA				
rit No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
38 ① ②				

CIRCUITS)

EMENT DATA				
No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
① & * ①	V405 X110 *	A-8125 A-8252 & WC-5 *①	26A03 FLY-37 *	A-97X D-35 & WC-12 * ①
① ③	V312 ① Y70F14 ③	A-8141 ① DY-9A ③	26S54 ① Y-4 ③	A-104X ① Y-17 ③
⑦	201R15 201R4 ⑦	WC-8 WC-4 ⑦	WC-22 WC-15 ⑦	WC-12⑥

MER CONNECTION DATA

cement Type Is Listed

Ram placement onnections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
13	9	13	10
Jumper 10 & 11	Jumper 8 & 7	Jumper 10 & 11	8
6	5	6	7
5 or 4	See Note ⑧	5 or 4	See Note ⑧
2	3	2	NC
1	1	1	3
9	Red Term. of WC-5	9	2
8	Blue Term. of WC-5	8	1
2 & 1	Orange & black term. of WC-5 across 3 & 1	2 & 1	Red & blue terms of WC-12 across 2 &1
	⑧ ⑨		⑧ ⑩

. term. #3 connection) to term. #3 of yoke(red lead).
tary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T8	5.2KΩ	3.7Ω	51X166	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	QUAM PART No.	
SP1	6"	PM	3.7Ω	12A516	6A21	① Used in console models
	10"	PM	3.7Ω	12A519 ①	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1A	Ant. Coil	0Ω	0Ω	9A2329-2				Channel 2
B	Ant. Coil	0Ω	0Ω	9A2329-3				Channel 3
C	Ant. Coil	0Ω	0Ω	9A2329-4				Channel 4
D	Ant. Coil	0Ω	0Ω	9A2329-5				Channel 5
E	Ant. Coil	0Ω	0Ω	9A2329-6				Channel 6
F	Ant. Coil	0Ω	0Ω	9A2329-7				Channel 7
G	Ant. Coil	0Ω	0Ω	9A2329-8				Channel 8
H	Ant. Coil	0Ω	0Ω	9A2329-9				Channel 9
I	Ant. Coil	0Ω	0Ω	9A2329-10				Channel 10
J	Ant. Coil	0Ω	0Ω	9A2329-11				Channel 11
K	Ant. Coil	0Ω	0Ω	9A2329-12				Channel 12
L	Ant. Coil	0Ω	0Ω	9A2329-13				Channel 13
L2	Neut. Coil	0Ω		31B-727				
L3A	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-2				Channel 2
B	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-3				Channel 3
C	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-4				Channel 4
D	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-5				Channel 5
E	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-6				Channel 6
F	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-7				Channel 7
G	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-8				Channel 8
H	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-9				Channel 9
I	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-10				Channel 10
J	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-11				Channel 11
K	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-12				Channel 12
L	RF, Mixer Grid & Osc. Coils	0Ω		9A2330-13				Channel 13
L4	Conv. Plate	.1Ω		31K-109				
L5	IF Trap	.1Ω		9A2320	17-4522 *	TV-130 *	6219 *	
L6	1st. Video IF	0Ω		9A2316	17-5001	TV-125 *	6231	
L7	2nd. Video IF	.1Ω	.1Ω	9A2317	17-5003	TV-128	6218 ■	Includes 47.25MC trap
L8	Fil. Choke	0Ω		9A2033	19-1002		4606	2.2 Microhenries
L9	3rd. Video IF	.1Ω	.1Ω	9A2318	17-5001	TV-128 ▲	6233 ▲	
L10	Fil. Choke	0Ω		9A2033	19-1002		4606	2.2 Microhenries
L11	Parasitic Suppressor	0Ω		9A2322				1 turn wire-wound on 10KΩ resistor
L12	Cathode Trap	0Ω		9A2321				
L13	4th. Video IF	.4Ω	.4Ω	9A2319	17-5004	TV-125	6234	
L14	Series Peaking Coil	7Ω		36A10	19-3075		6175	60 Microhenries
L15	Shunt Peaking Coil	17Ω		36A22	19-3300	TV-185	6155	290 Microhenries
L16	4.5MC Trap	.2Ω		9A2074	20-1004	TV-151	1469	
L17	Shunt Peaking Coil	10Ω		36A1	19-3100	TV-181	6177	100 Microhenries
L18	Shunt Peaking Coil	9.5Ω		36A25	19-3100 ♦	TV-181 ♦	6177 ♦	100 Microhenries, wound on 470Ω resistor
L19	Series Peaking Coil	12.5Ω		36A12	19-4160	TV-184 ▲	6180 ▲	160 Microhenries, wound on 22KΩ resistor
L20	Shunt Peaking Coil	14Ω		36A2	19-4201	TV-184	6154	190 Microhenries
L21	1st. Sound IF	2Ω		9A2201	17-1031 ■	TV-113 *	6203 *	
L22	2nd. Sound IF	2.4Ω	2Ω	9A2323	17-1021	TV-113	6203	
L23	Ratio Det.	3.6Ω	.5ΩCT	9A2295	17-3497	TV-115	6205	Tertiary winding-.5Ω
L24	Horiz. Osc.	65Ω		9A2096	19-1576	TV-163	6210	

* Use one winding only.
■ Drill mounting holes.
▲ Detune trap.
♦ Parallel with 470Ω resistor.
▲ Parallel with 22KΩ resistor.

CORONADO MODELS TV2-9157A, TV2-9159A, TV2-9160A, TV2-9161A, TV2-9162A

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L25	.270ADC	40.6Ω	.83 HY	52X95	C5037 ①	C-2996 ①	C-2326 ①	26C44	C-23X ①

① Drill one new mounting hole .

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			CORONADO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	4/10A 125V		16X146	313.400 (3AG S/B-4/10A)	357001	MDL 4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M2	Tuner	25A1125	VHF - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
M3	Tuner	25A1128	UHF-VHF - Model TV2- 9161A
M4	Trap	31K-919	VHF Ant. Input Filter - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Trap	31K-225-03	VHF Ant. Input Filter - Model TV2-9161A
M5	Focus Magnet	2A438-2	Includes centering device
M6	Ion Trap	2A421	
B2	Trimmer Cap.	17A269	Horiz. Drive (120-400MMF)
	Knob	10A820-1	Fine tuning - Mahogany cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A820-2	Fine tuning - Oak cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A846-1	Fine tuning - Model TV2-9161A
	Knob	10A840-1	Contrast - Mahogany cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A840-2	Contrast - Oak cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A847-1	Contrast - Model TV2-9161A
	Knob	10A842-1	VHF Channel Selector - Mahogany Cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A842-2	VHF Channel Selector - Oak Cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A852-1	VHF Channel Selector - Model TV2-9161A
	Knob	10A853-1	UHF Channel Selector - Model TV2-9161A
	Knob	10A843-1	Volume - Mahogany Cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A843-2	Volume - Oak Cabinets - Models TV2-9157A, TV2-9159A, TV2-9160A, TV2-9162A
	Knob	10A830-1	Volume - Model TV2-9161A
	Safety Glass	17X186	
	Mask	4X1241-1	

TROUBLE SHOOTING AIDS (cont)

L. F. BLANKENSHIP
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HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution-V18, V19, V20 and V21. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C82, C81, C84, C80, R103, R104, and other associated components.	Check L24, C76, C77, R95, R98, R94, R96 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20 and V22. Check T3, T5A, R103, R104, and other associated components.

BLOOMING

Check by substitution V19, V20, V21 and V22. Check R109, R103, R104, R102, C7 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss Of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak Or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6, V7 and V8. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

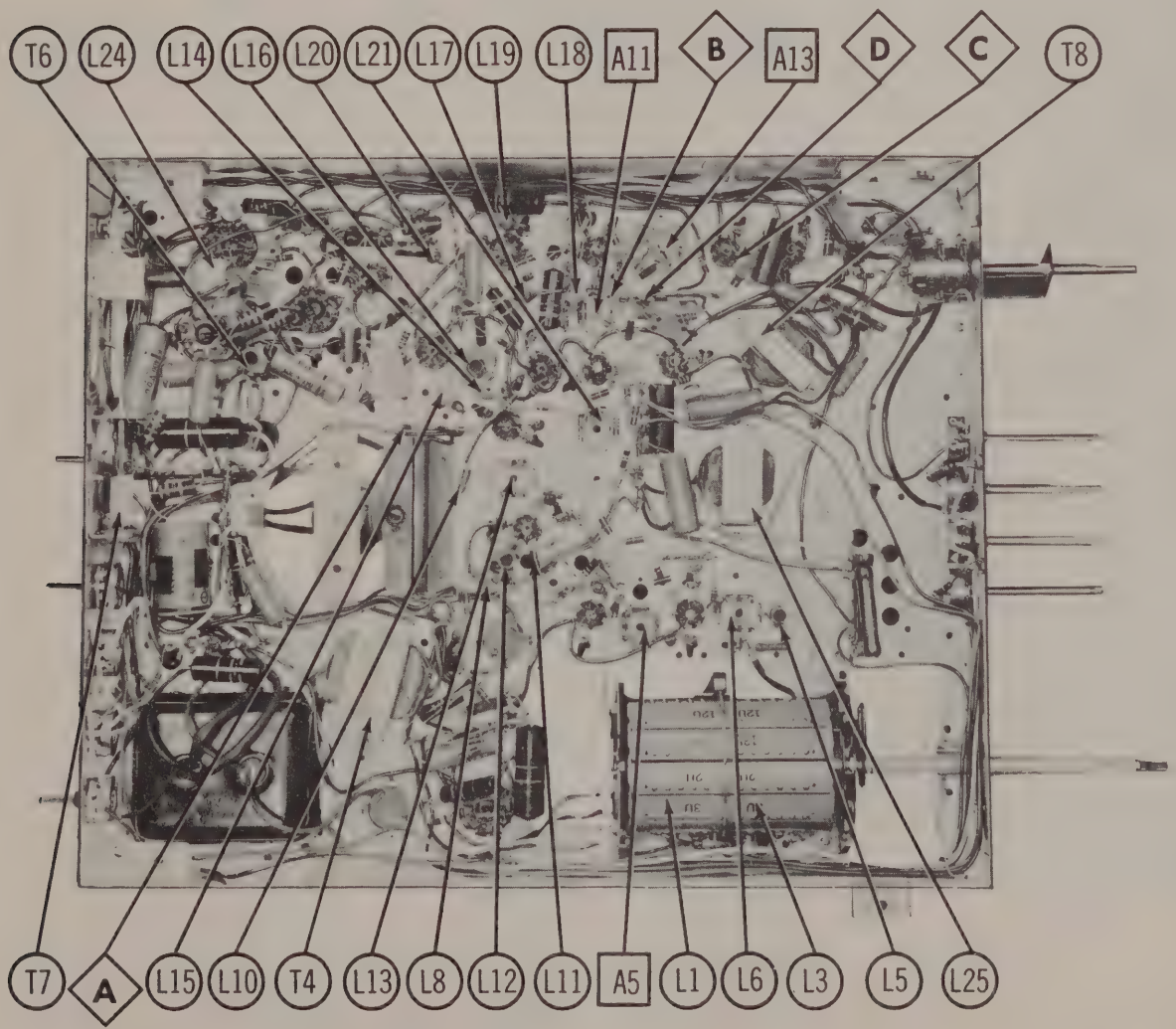
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner oscillator Circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible , one at a time, through the small hole in the cabinet above and slightly to the left of the channel selector shaft.

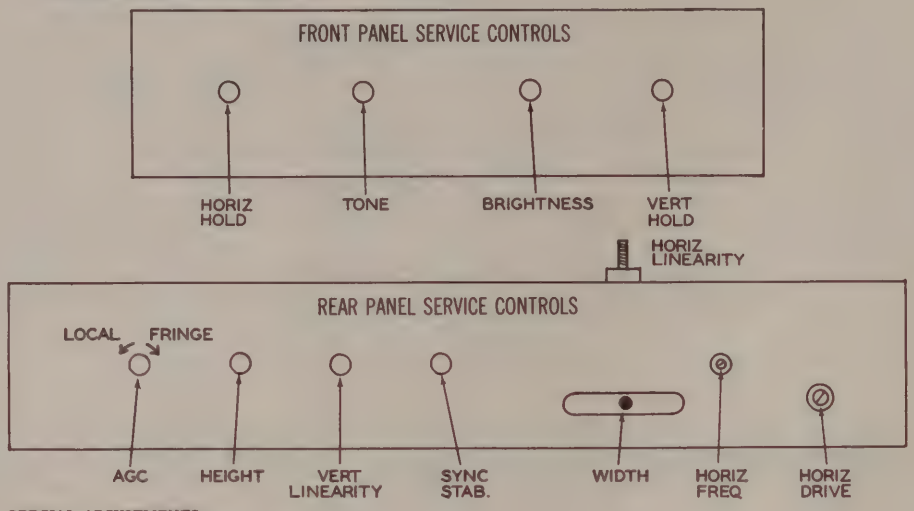
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 5 wood screws holding plastic strip at the top of the safety glass. Remove plastic strip and safety glass. The extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS:

AGC CONTROL ADJUSTMENT

Turn set on and tune in strongest station in that area. Turn the AGC control(R6) clockwise until the picture shows signs of overloading, faded out picture and buzz in sound. Turn R6 back counter clock wise from the point where overloading occurs until no sign of overloading is noted.

SYNC STABILITY CONTROL ADJUSTMENTS

Turn set on and tune in strongest TV station in that area. Rotate the sync stability control (R9) clockwise until bending is noted near the top of picture. Turn R9 counter clock wise until picture bending disappears and sync is stable.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontol hold control at its mid-range position and adjust the horzontol frequency slug (L24) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz adjust the ratio detector secondary (L23) located on top of chassis.

FUSES

One fuse is used for L.V. power supply protestion. (For location see tube placement chart.)

CENTERING

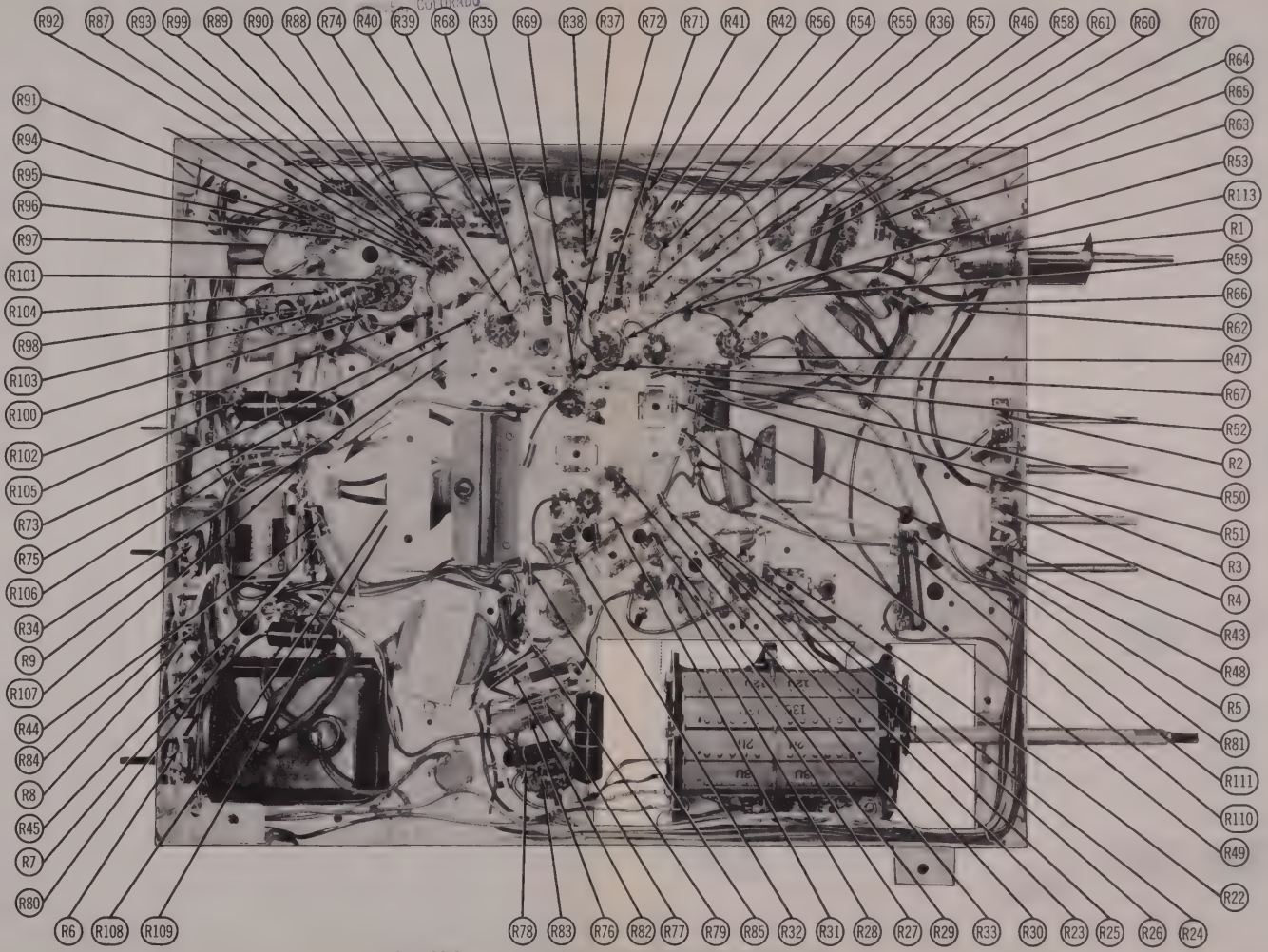
Centering is accomplished mechanically by means of a centering lever on the P.M Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front panel of cabinet.
2. Remove 4 wood screws. Remove rear cover.
3. Remove 2 wood screws holding antenna bracket.
4. Disconnect speaker leads.
5. Remove 4 speaker nuts. Remove speaker.
6. Remove 5 chassis bolts. Remove chassis.

...SHIP
...ST.
COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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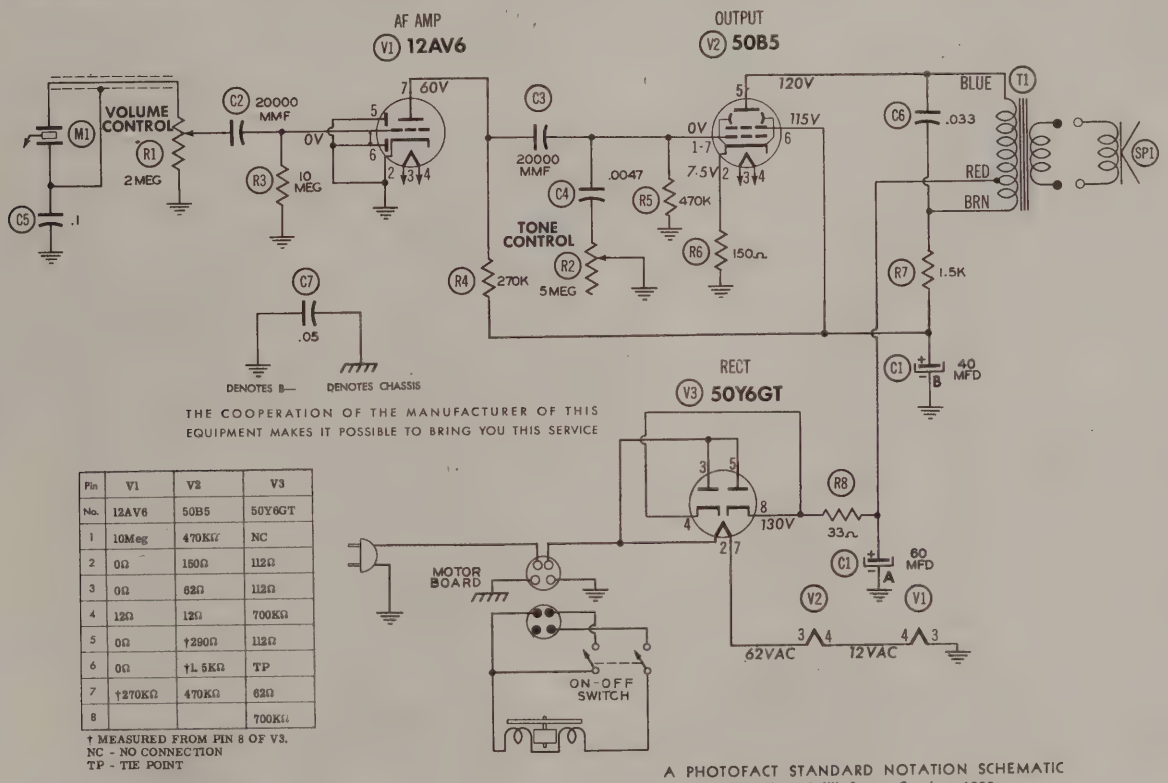
CRESCENT
MODEL 600

CRESCENT
MODEL 600

TRADE NAME	Crescent Model 600
MANUFACTURER	Crescent Industries, 5900 Touhy Ave., Chicago 31, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amp., 50B5 Output, 50Y6GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.23 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - CRESCENT MODEL 500 - SEE PHOTOFACT SET #197 - FOLDER #4 OR RECORD CHANGER MANUAL CM-5.



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

Pin No.	V1	V2	V3
1	10Meg	470KΩ	NC
2	0Ω	150Ω	112Ω
3	0Ω	62Ω	112Ω
4	12Ω	12Ω	700KΩ
5	0Ω	†290Ω	112Ω
6	0Ω	†1.5KΩ	TP
7	†270KΩ	470KΩ	62Ω
8			700KΩ

† MEASURED FROM PIN 8 OF V3.
NC - NO CONNECTION
TP - TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CRESCENT PART No.	STANDARD REPLACEMENT		
V1	AF Amp.	12AV6	12AV6	7BT	
V2	Output	50B5	50B5	7BZ	
V3	Rectifier	50Y6GT	50Y6GT	7Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	CRESCENT PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	60	150				TCD49	TDL-8040-150	FMD-1550	
B	40	150							
C2	20000			DF-203		PT412	IMP4-S2	330412	
C3	20000			DF-203		PT412	IMP4-S2	330412	
C4	.0047	600		D6-472		PT6247	IMP6-D47	3306247	
C5	.1	400		DF-104		PT401	IMP4-P1	330401	
C6	.033	400				PT4133	IMP4-S33	3304133	
C7	.05	400		DF-503		PT415	IMP4-S5	330415	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CRESCENT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	2Meg	$\frac{1}{2}$	740035					Volume
R2	5Meg	$\frac{1}{2}$	740036					Tone

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CRESCENT PART No.	IRC PART No.	
R3	10Meg	$\frac{1}{2}$		BTS-10Meg	
R4	270KΩ	$\frac{1}{2}$		BTS-270K	
R5	470KΩ	$\frac{1}{2}$		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CRESCENT PART No.	IRC PART No.	
R6	150Ω	$\frac{1}{2}$		BTS-150	
R7	1500Ω	$\frac{1}{2}$		BTS-1500	
R8	33Ω	1			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CRESCENT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3.3Ω	700044	Z1102 ①	A-3031①	A-3330①	24S50A①		① Drill one new mounting hole.

SPEAKER

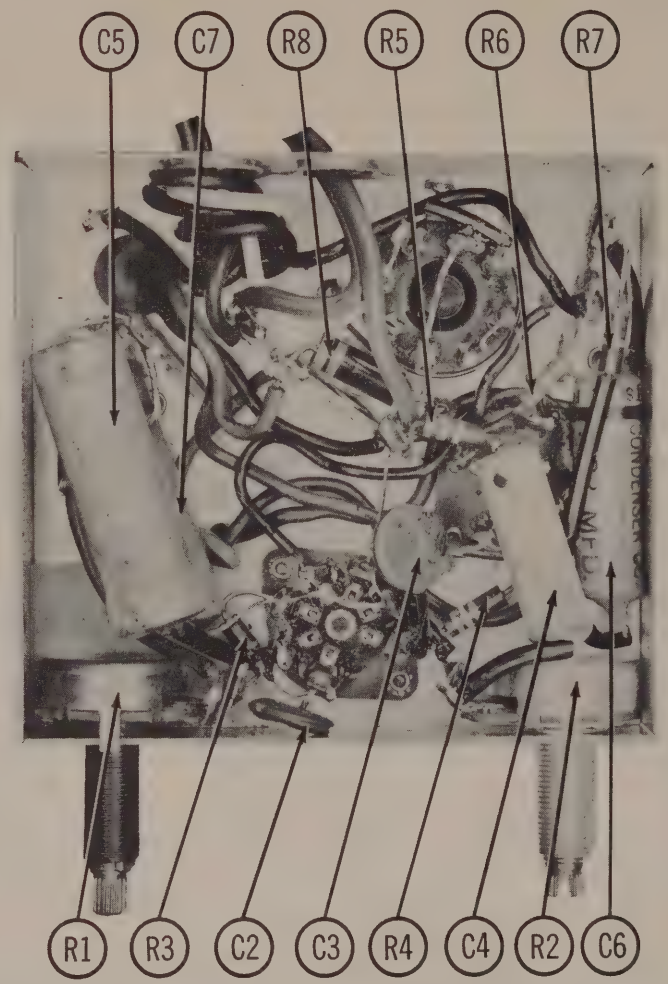
ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CRESCENT PART No.	QUAM PART No.	
SP1	4" X 6"	PM	3.3Ω	011109	46A1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	CRESCENT PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		ACD-C-2J	A-1 A-3	46T	0-1 or S-1 and 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	CRESCENT PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		*A-85LP or †A-75LP or ♦A-75LPD and *A-85 or †A-75 or ♦A-75D	*A-319 or †A-347 or ♦A-347D and *C-309 or †C-348 or ♦C-348D	*W-5MGA or †W-5MGS or ♦W-5MGD and *W-5A or †W-5S or ♦W-5D	* Metal † Jewel ♦ Diamond

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

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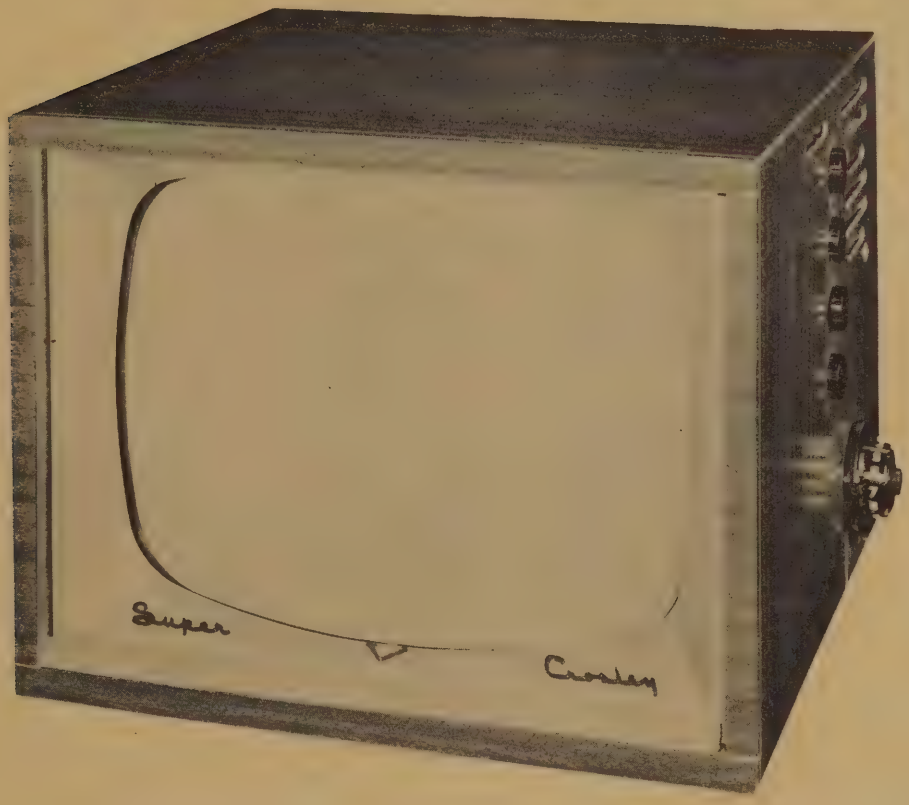
CROSLEY MODELS H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)



MODEL H-17TOMUc

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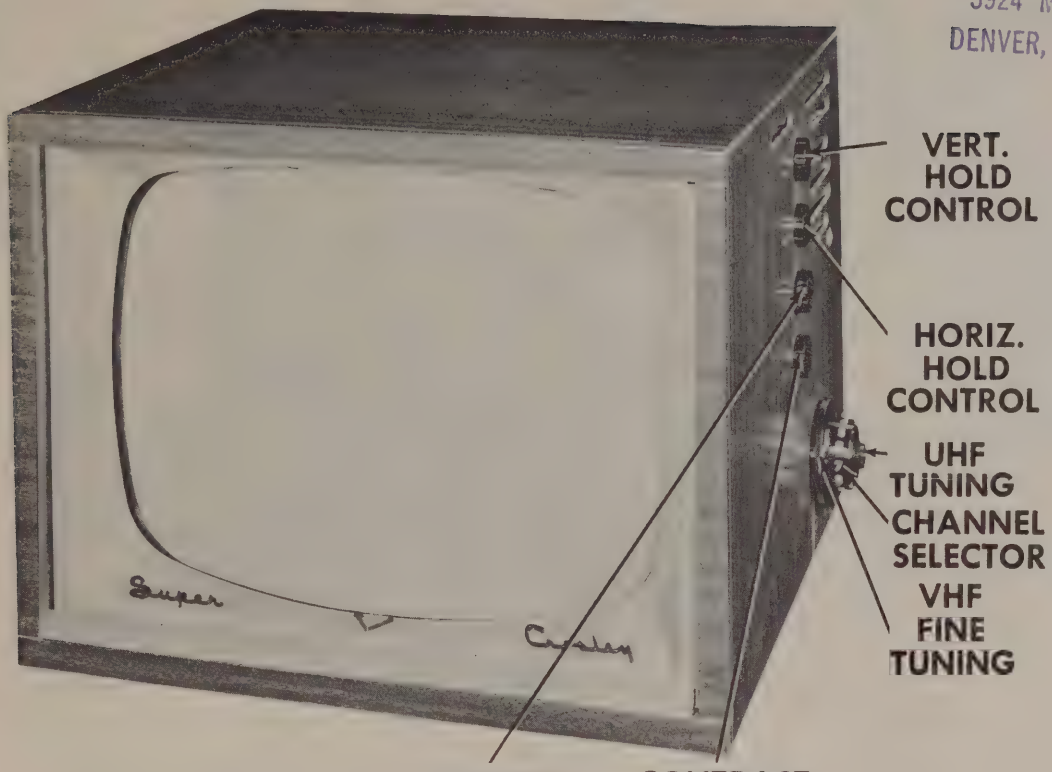
DENVER, COLORADO

CROSLEY MODELS H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)



CROSLEY MODEL 17TOMUc

TRADE NAME	Crosley	MODELS	CHASSIS
		H-17TOBUc, H-17TOMUc, H-17TOWUc	441
		H-21COBHb, H-21COMHb, H-21COSBHb, H-21COSHb, H-21COWHb, H-21HCBHb, H-21HCMHb, H-21HCWHb, H-21TOBHb, H-21TOMHb, H-21TOWHb	434
		H-21COBUc, H-21COMUc, H-21COSBUc, H-21COSUc, H-21COWUc, H-21HCBUc, H-21HCMUc, H-21HCWUc, H-21TOBUc, H-21TOMUc, H-21TOWUc	442
		H-21HPBUc, H-21HPWUc	445

MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 13 thru 16
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 7, 10
Resistor Identification 19, 20
Photographs (Cont)
Trans., Inductor & Alignment Identification 3
Production Changes 16
Resistance Measurements 8
Servicing in the Field 18
Schematic (Alternate Tuner) 17
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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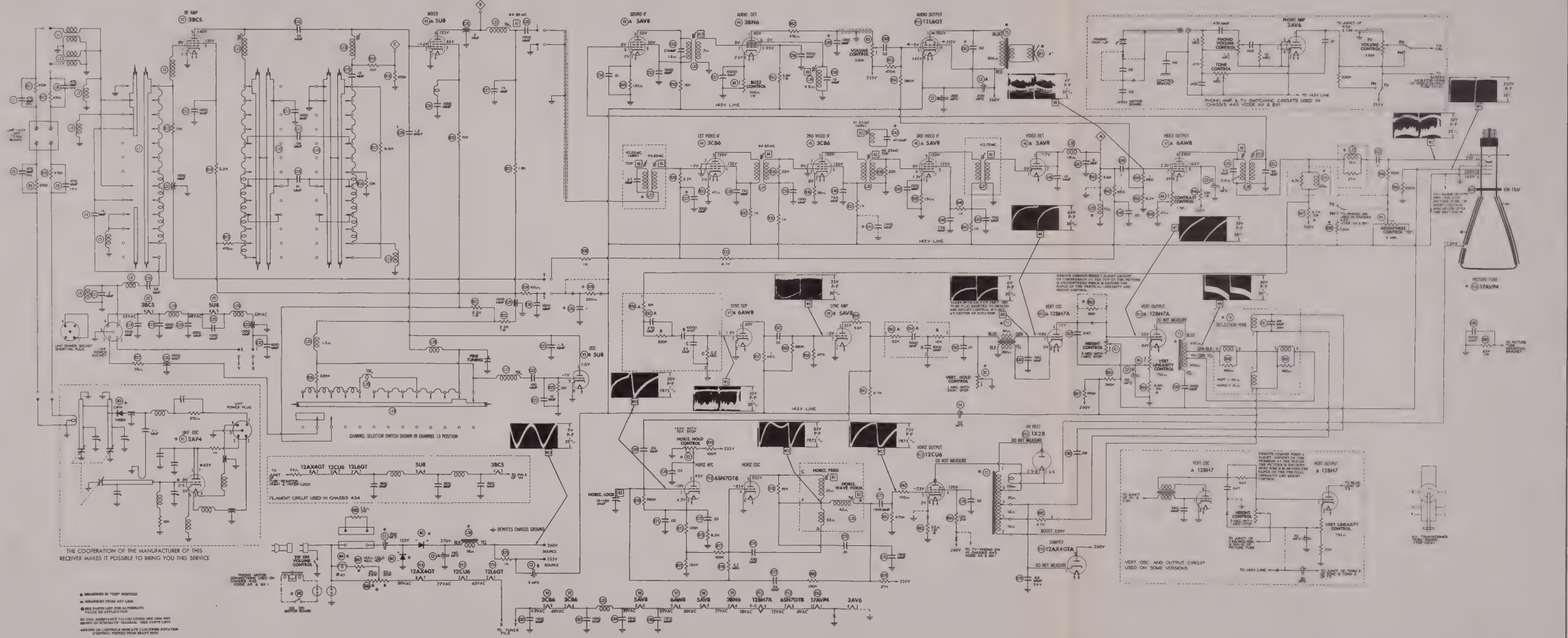
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CHANNEL SELECTION SWITCH SHOWN IN CHANNEL 13 POSITION
FILAMENT CIRCUIT USED IN CHASSIS 434
PHONO AMP & TV SWITCHING CIRCUITS USED IN CHASSIS 445 (CODE AX & BX)
VERT. OSC. AND OUTPUT CIRCUIT USED ON SOME VERSIONS
145V LINE
CROSLEY MODELS H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COWHb, COWUc, COSBHb, COSBUc, COSHb, COSUc, COSXb, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPMUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)

CROSLEY MODELS H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COSXb, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPMUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)

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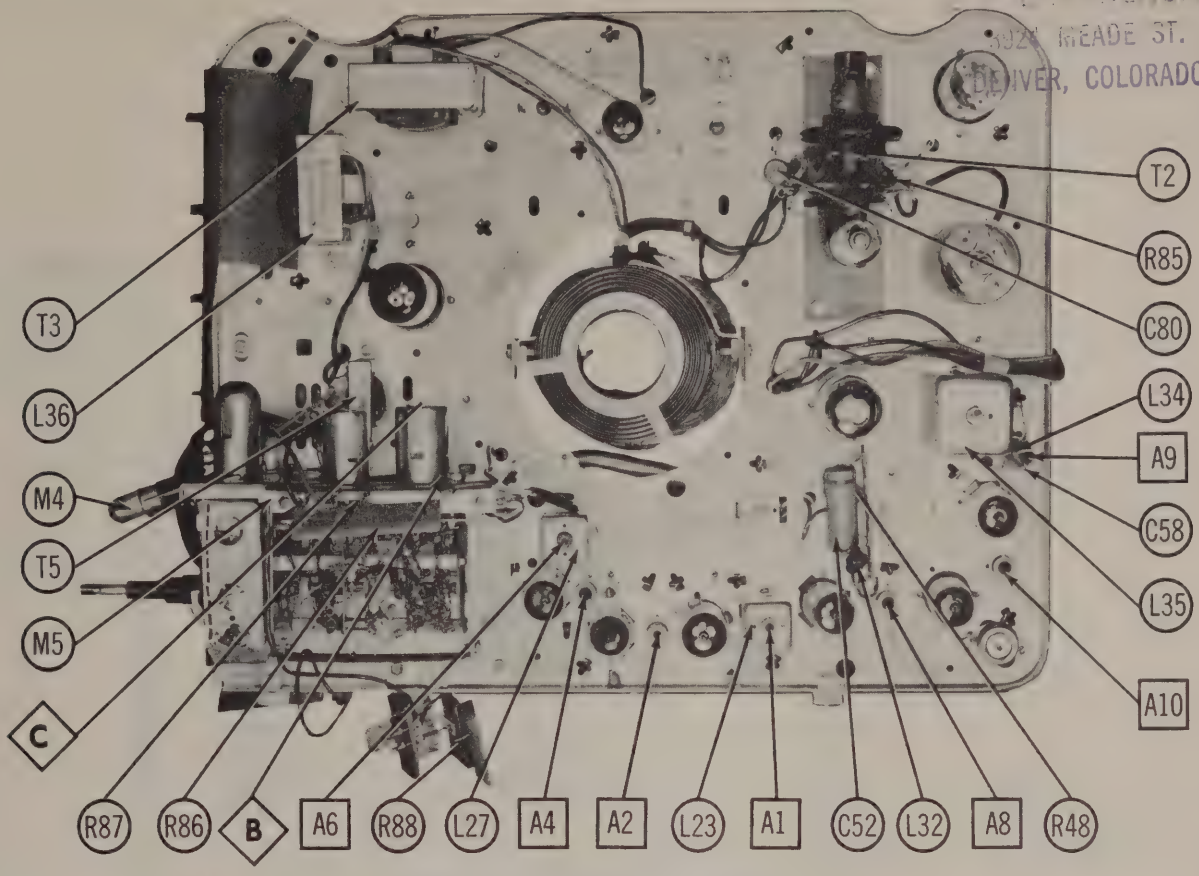
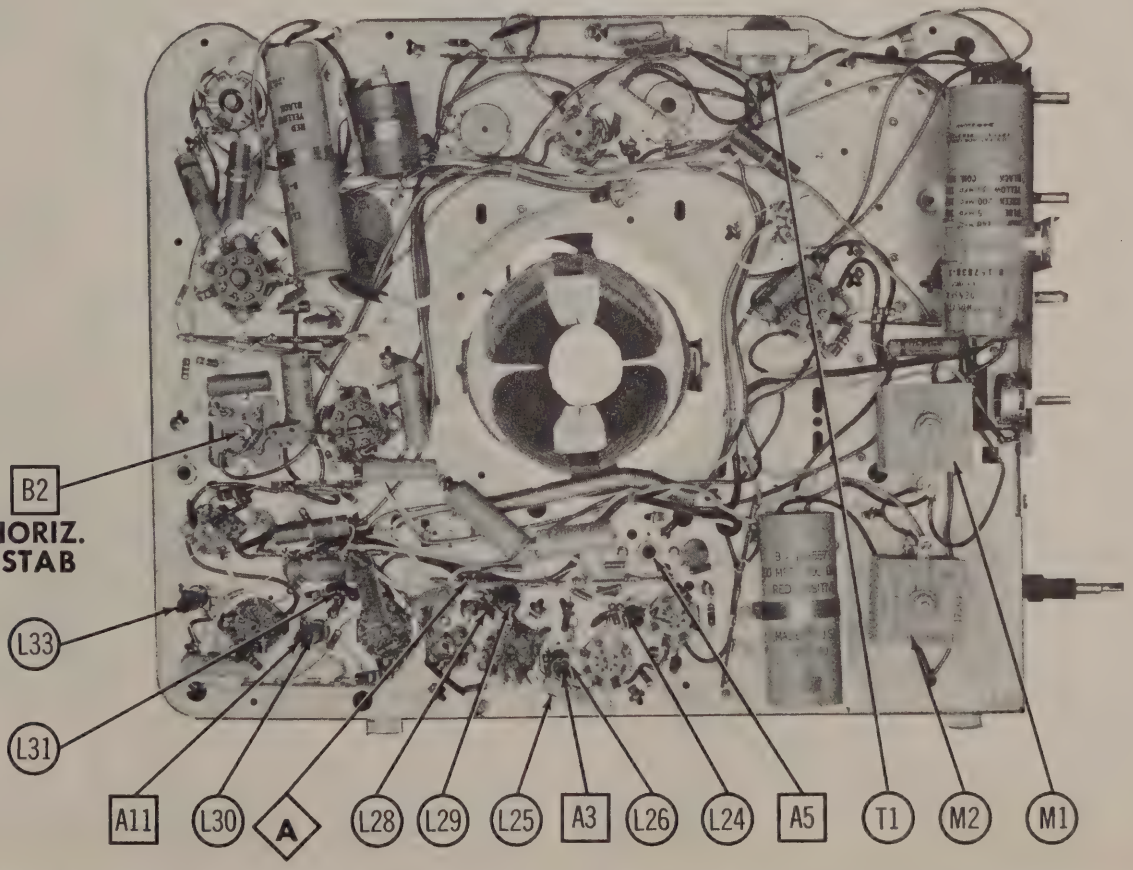


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

CROSLEY MODELS H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)

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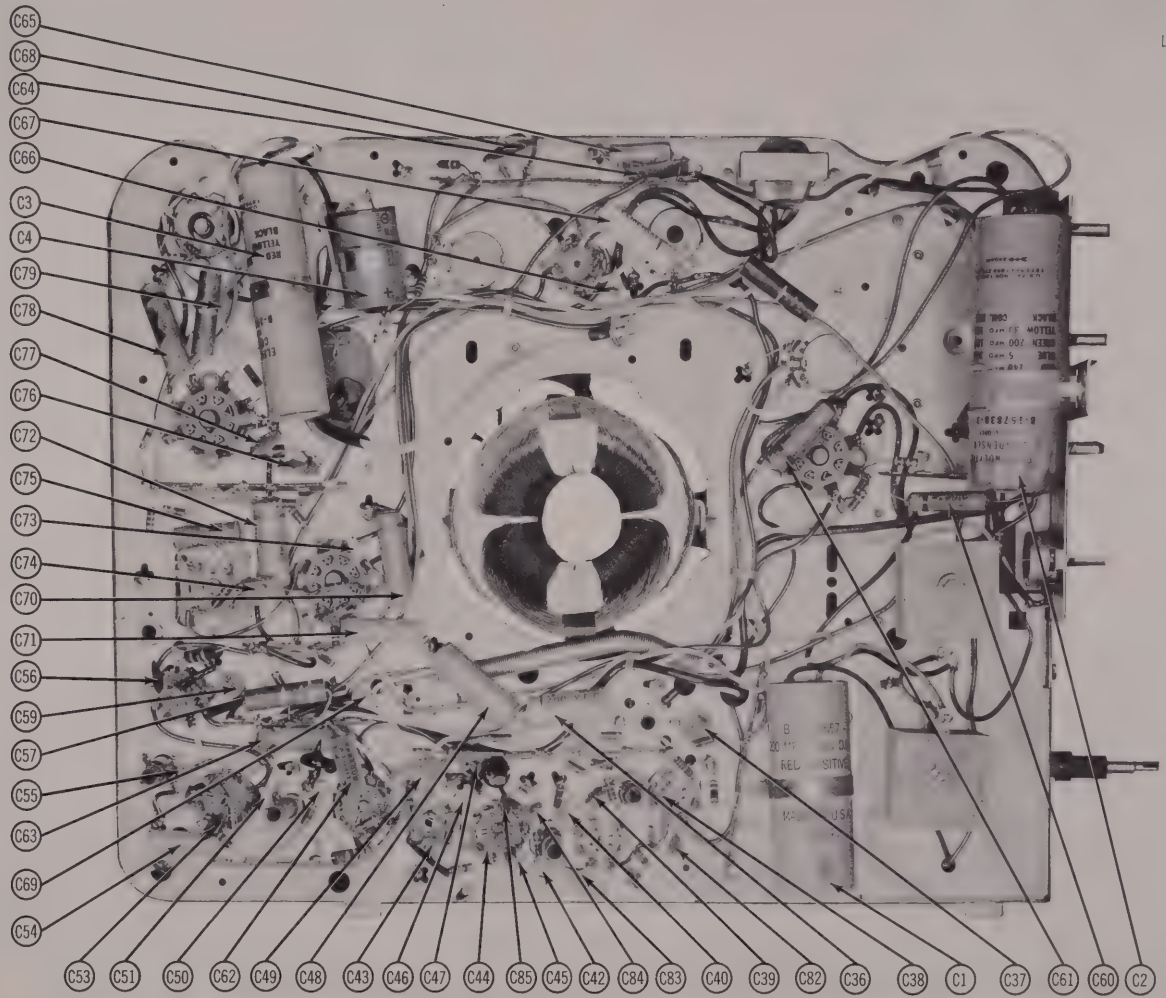

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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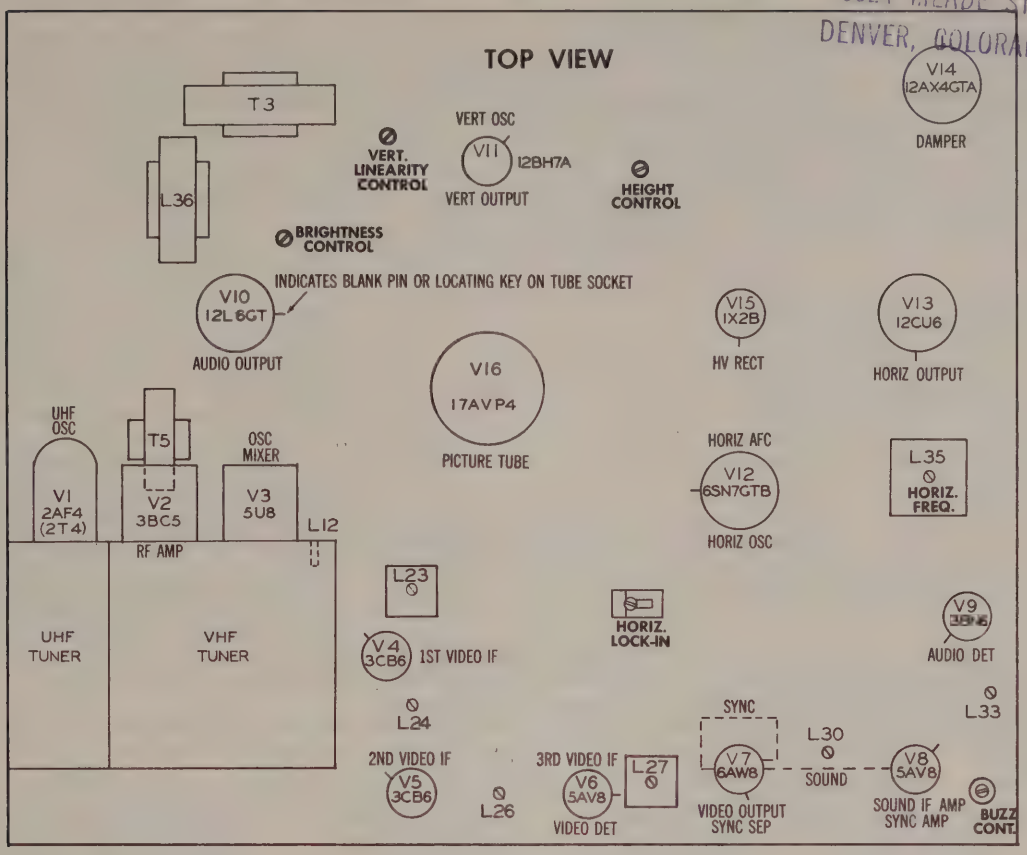
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

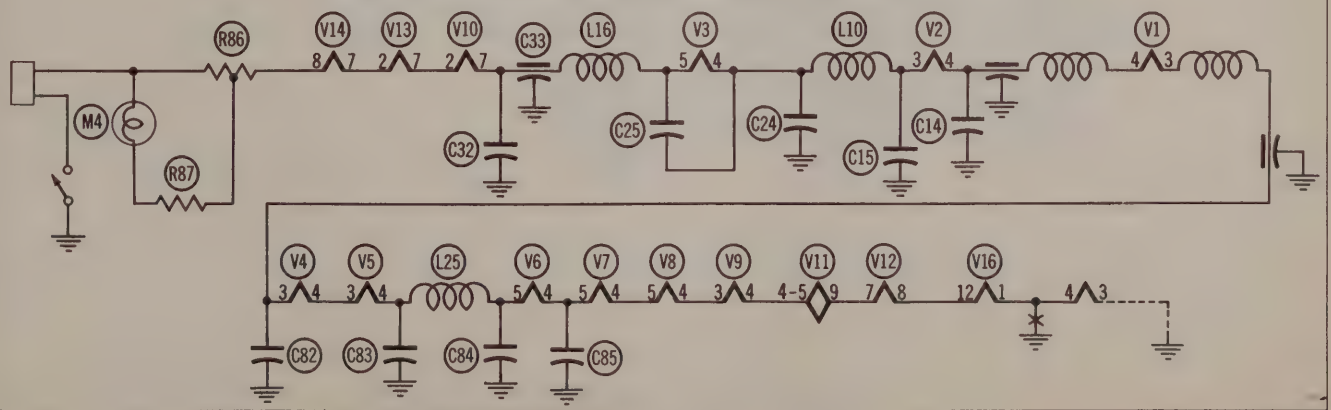
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V10 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V16**
Has pic, no sound - **V8, V9, V10**
Overloaded picture -

SYNC FAILURE
No vert. sync - **V8, V11**
No horiz. sync - **V8, V12**
No vert. or horiz. sync - **V7, V8**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V16**
No vertical deflection - **V11**
Poor vert. linearity or foldover - **V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V15, M1, M2**
Vert. off freq. - **V8, V11**
Horiz. off freq. - **V8, V12**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series may cause the set to be inoperative. (See Circuit Below).



CROSLEY MODELS H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
One side of chassis is connected to one side of 117V power line.
The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V12) to disable the high voltage.

VIDEO IF ALIGNMENT

Turn contrast control to minimum position. Connect the negative lead of a 3 volt bias supply to the ungrounded side of C48. Connect positive lead to chassis ground. Attenuate generator output to maintain not more than -2 volts on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to point Ⓑ. Low side to chassis.	43.75MC (Unmod)	Any non-interfering channel	DC probe to point Ⓐ. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	42.25MC	"	"	A2	Adjust for maximum deflection. If two peaks occur, use the peak nearest the clip end of the coil.
3.	"	"	41.25MC	"	"	A3	Adjust for MINIMUM deflection. Use only enough generator output to produce 0.5 volts at MINIMUM reading . The correct null should occur when the core is nearest the end of coil opposite the clip end. Repeat steps 2 and 3.
4.	"	"	44.85MC	"	"	A4, A5	Adjust for maximum deflection. Use peak nearest clip end of coil.
5.	"	"	47.25MC	"	"	A6	This trap is not used on all sets. When trap is employed its adjustment (A6) will be the top core in the first video IF coil whose adjustment is A5. Adjust A6 for MINIMUM deflection on null that occurs when A6 is adjusted fartherest counter clockwise. Repeat steps 4 and 5.
6.	"	High side to point Ⓒ. Low side to chassis.	44.85MC	"	"	A7	Connect a 100Ω resistor in series with a .001MFD from pin 1 (grid) of 3CB6 (V4) to chassis. Adjust A7 for maximum deflection. Remove 100Ω and .001MFD capacitor from pin 1 of V4 and chassis.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Leave bias battery connected as under "Video IF Alignment".
Use only enough sweep and marker generator output to provide usable indication on scope.
If necessary to disable the local oscillator to reduce the possibility of erroneous indications, remove the converter tube from its socket and replace with a 5U8, which has pin 1 removed.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	43.5MC (10MC Swp)	41.25MC 42.25MC 43.75MC 44.85MC 45.75MC 47.25MC	Any	Vert. Amp. to point Ⓐ. Low side to chassis.		Check for response similar to Fig. 1. If necessary SLIGHTLY retouch A1, A2, A4, A5 and A7. Adjust A3 so that 41.25MC marker falls in trap notch. If markers are off a great amount, repeat "Video IF Alignment". Replace original 5U8 in its socket. Remove 3 volt bias supply.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to point Ⓐ. Low side to chassis.	Not used	4.5MC (400∿mod)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 2) to pin 11 (cathode) of picture tube. Low side to chassis.	A8	Adjust for MINIMUM 400∿ indication on scope.

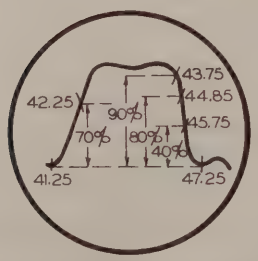


FIG. 1

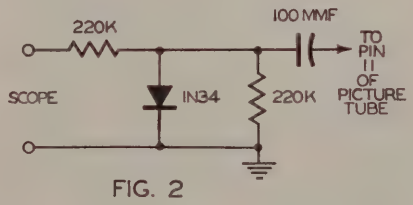


FIG. 2

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ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a strong TV signal. Turn the buzz control (R8) 90 degrees from maximum clockwise rotation. Adjust A9 for maximum volume.
Reduce the signal strength into the receiver by inserting an attenuator in series with the antenna and receiver antenna terminals. If a suitable attenuator is not available, remove the antenna from the antenna terminals and stray feed the signal into the receiver by placing the antenna near the antenna terminals. Adjust A10 and A11 for maximum volume. Adjust R8 for minimum noise. Reconnect antenna and readjust A9 for maximum volume. If necessary, reduce volume so that this peak can be heard.

ALTERNATE SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR, AM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Set volume control at low volume level.

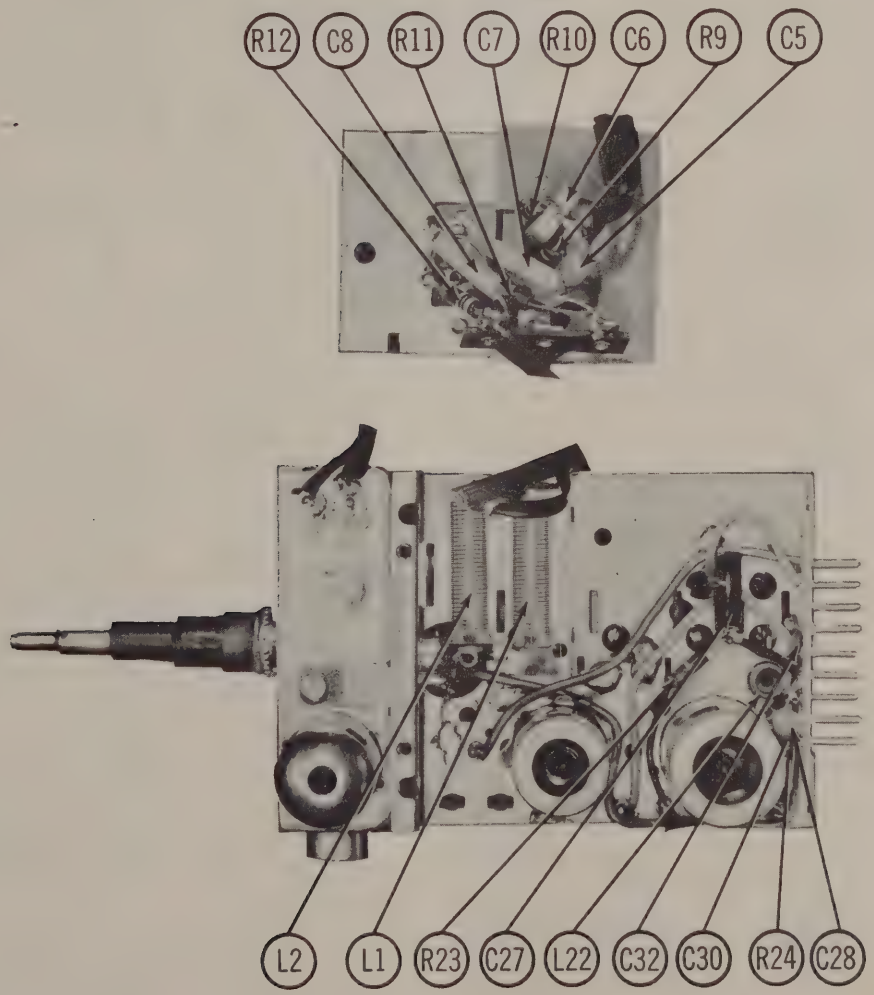
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to point (A). Low side to chassis.	4.5MC (400∿Mod)	4.5MC	Any non-interfering channel	Across secondary of audio output transformer.	A9	Set buzz control (R8) 90 degrees from maximum clockwise rotation. Adjust A9 for maximum 400∿ indicaton on scope.
10.	"	"	"	"	"	"	A10,A11	Attenuate generator output so that signal level is below the limiting level of the 3BN6 as evidenced by background hiss and noise. Adjust A10 and A11 for maximum response on scope.
11.	"	"	Not used	4.5MC (400∿Mod)	"	"	R8	Use high signal generator output and adjust R8 for MINIMUM 400∿ indication on scope.
12.	"	"	4.5MC (400∿Mod) 50KC Swp)	4.5MC	"	"	A9	With volume control at low level retouch A9 for maximum 400∿ indication on scope.

ALIGNMENT OF UHF-VHF TUNER PART #D-158692-1

The UHF-VHF tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

ALIGNMENT OF VHF TUNER PART #158673

The VHF tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.



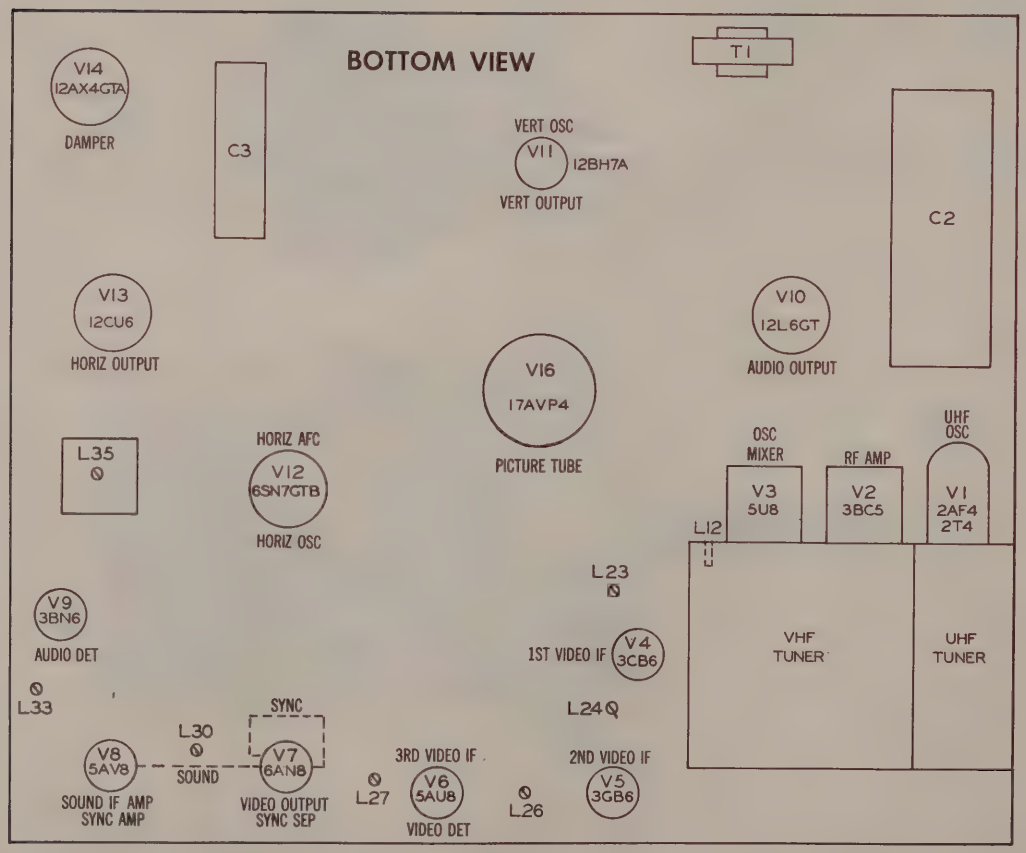
TUNER TOP VIEW

CROSLEY MODELS H-177OBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	2AF4	*■5. 7KΩ	10KΩ	11Ω	12Ω	0Ω	10KΩ	*■5. 7KΩ		
V 2	3BC5	1Meg	0Ω	13Ω	12Ω	■800Ω	■2. 5KΩ	0Ω		
V 3	5U8	■2. 5KΩ	480KΩ	■15KΩ	13Ω	14Ω	■2. 1KΩ	0Ω	0Ω	15KΩ
V 4	3CB6	1Meg	47Ω	11Ω	10Ω	■1KΩ	■1KΩ	0Ω		
V 5	3CB6	1Meg	56Ω	10Ω	9Ω	■1KΩ	■1KΩ	0Ω		
V 6	5AV8	. 1Ω	5. 6KΩ	5. 6KΩ	8Ω	9Ω	. 1Ω	150Ω	■2KΩ	■1KΩ
V 7	6AW8	0Ω	2. 2Meg	■1Meg	7Ω	8Ω	500Ω	1Meg	†33KΩ	†4. 7KΩ
V 8	5AV8	0Ω	47KΩ	■11. 5KΩ	6Ω	7Ω	. 8Ω	150Ω	■18KΩ	■18KΩ
V 9	3BN6	270Ω	3Ω	6Ω	5Ω	■5. 6KΩ	4. 8Ω	†330KΩ		
V 10	12L6GT	NC	17Ω	†260Ω	†56Ω	270KΩ	TP	14Ω	170KΩ	
V 11	12BH7A	▲1KΩ	■2.8Meg	8KΩ	5Ω	5Ω	▲2.8Meg	500KΩ	260Ω	4Ω
V 12	6SN7GTB	750KΩ	†100KΩ	300KΩ	250KΩ	†28KΩ	0Ω	4Ω	3Ω	
V 13	12CU6	NC	20Ω	TP	†12KΩ	470KΩ	TP	17Ω	22Ω	Top Cap ▲20Ω
V 14	12AX4GTA	NC	NC	400KΩ	NC	†56Ω	TP	20Ω	23Ω	
V 15	1X2B	PINS 1 - 8 HAVE INFINITE RESISTANCE								Top Cap ▲350Ω
V 16	17AVP4	0Ω	0Ω	Pin 6 170KΩ	Pin 10 ▲300KΩ	Pin 11 ■300KΩ	Pin 12 3Ω			

* MEASURED IN "UHF" POSITION.
■ MEASURED FROM 145V LINE.
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V14.
TP - TIE POINT
NC - NO CONNECTION



TUBE PLACEMENT CHART

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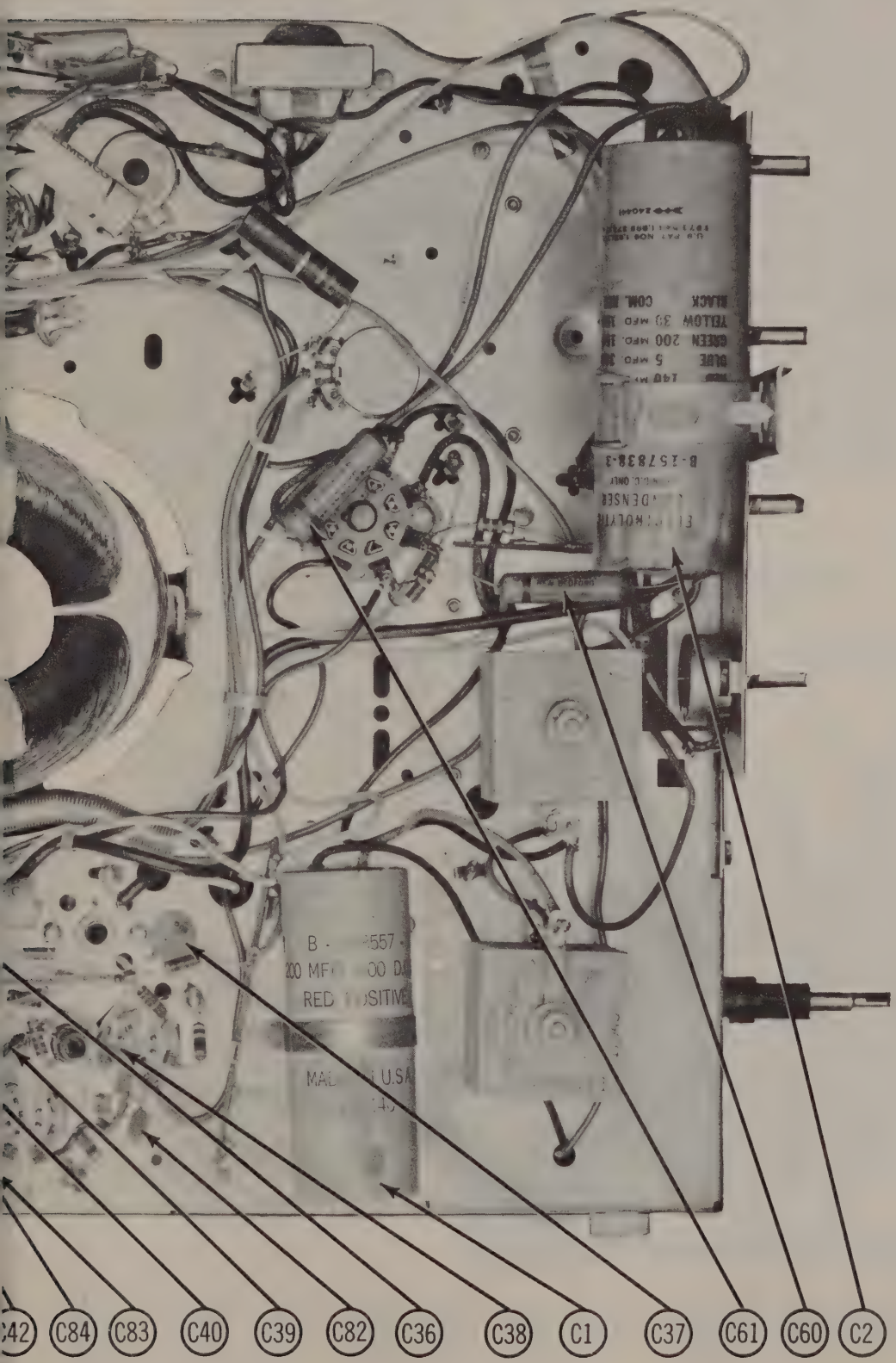
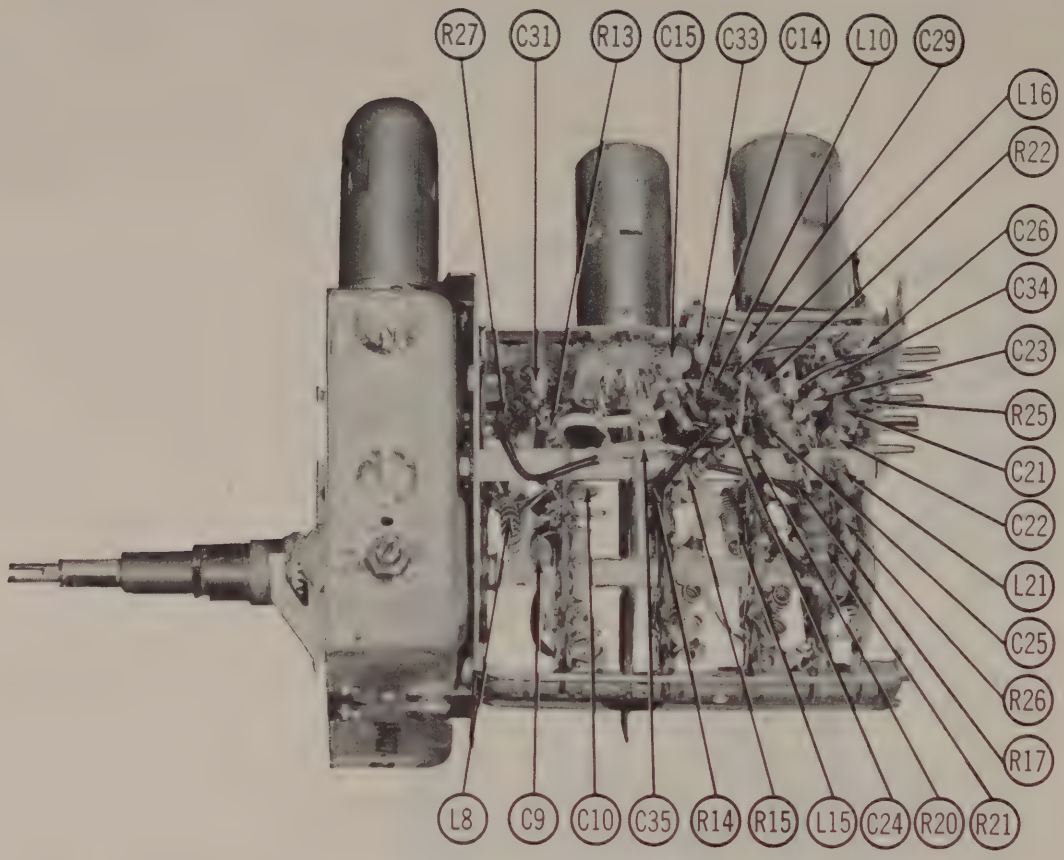
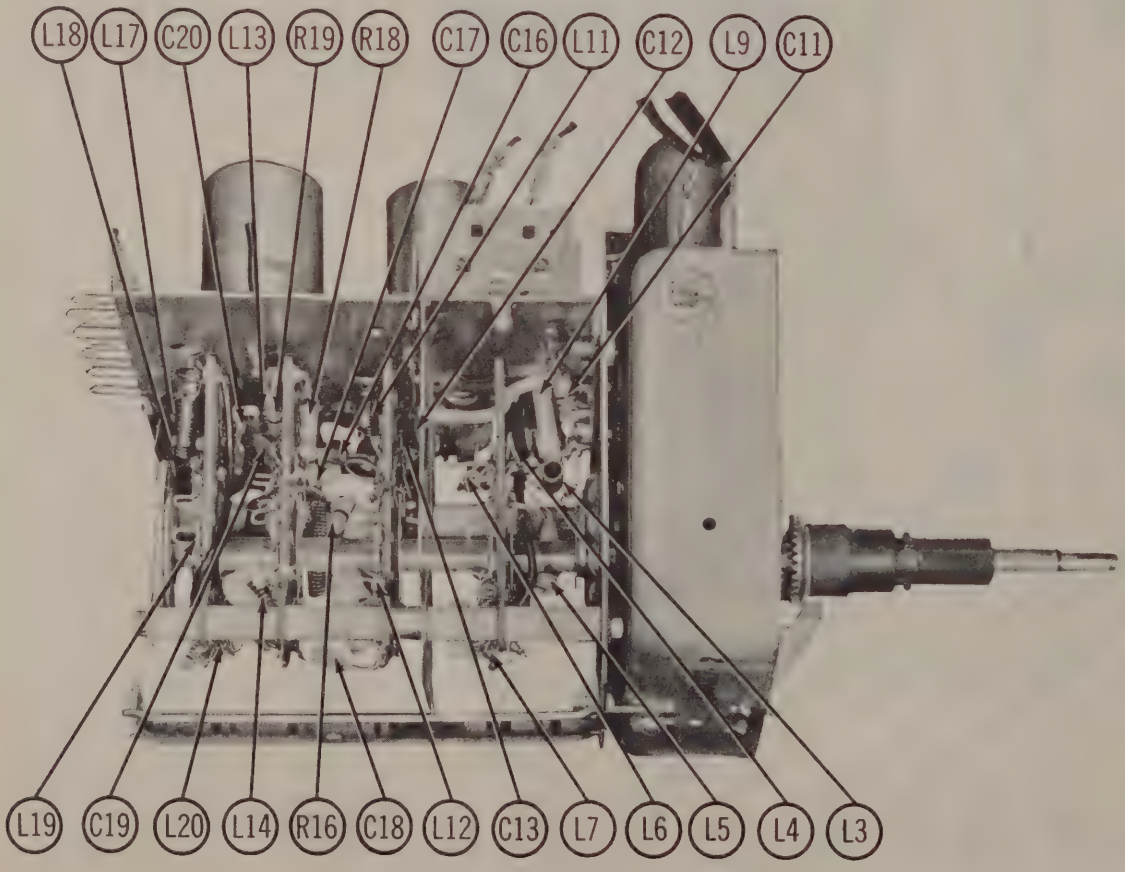


APACITOR IDENTIFICATION



UHF-VHF TUNER-RIGHT SIDE



UHF-VHF TUNER-LEFT SIDE

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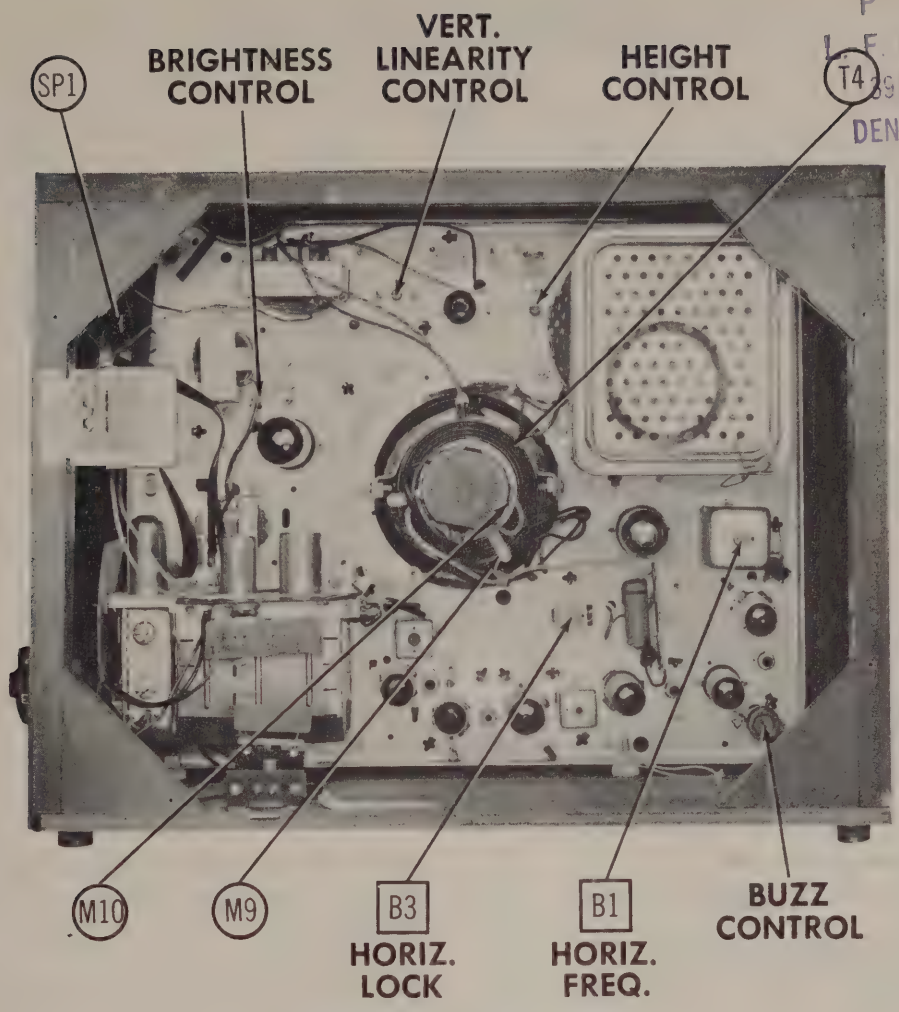

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the contrast for normal contrast.

Preset horizontal lock trimmer (B3) one-half turn from its maximum clockwise position.

1. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until picture synchronizes horizontally.

2. Connect the vertical amplifier of the oscilloscope thru a 10MMF capacitor to lug 4 of L35. Low side to chassis. Adjust the horizontal waveform slug (B2) until waveform similar to Fig. 3 is obtained. While making this adjustment keep the picture in sync with the horizontal hold and if necessary, B1 and B3.

3. Turn the horizontal hold control fully counter clockwise. Turn B1 counter clockwise until the picture just loses sync, then turn B1 clockwise until picture is just ready to pull into sync.

4. Turn the horizontal hold control clockwise ntil picture falls out of sync. Then turn horizontal hold control counter clockwise until picture just falls into sync. If more than 3 bars are present just before picture falls in sync, adjust B3 clockwise, If less than three bars are present turn B3 counter clockwise.

Recheck steps 3 and 4 until the effective pull-in range of the horizontal hold control is from 60 to 120 degrees. Set the horizontal hold so that when switching on and off channel the picture returns in sync.

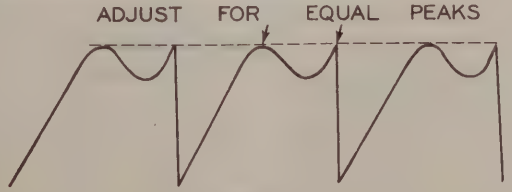

FIG. 3

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V13 and V14. Check M1 and M2. Check T2, T4A, R88, R86, R84, C76, C77 and other associated components.

DRIVE LINES

Check by substitution V13 and V14. Check C76, C77, R84, T2 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V13 and V14. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V12, V13 and V14. Check C71, C72, R73 for open. Check L35, R74, R2 and other associated components.

XMAS TREE EFFECT

Check by substitution V12, V13 and V14. Check T2 and T4 for internal arcing. Check L35, C73, C74, C75, R72 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V11. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T3, T4B, C4, R64 and other associated components.	Check T1, R67, R65, C66 and other associated components.

INSUFFICIENT SWEEP

Substitute V11. Check height and vertical linearity controls for proper operation. Check R65, T3 and other associated components.

COMPRESSED AT BOTTOM

Substitute V11. Check R67, R65, R7 and other associated components.

COMPRESSED AT TOP

Substitute V11. Check R64, R6, T3, T4A, C2D and other associated components.

FOLDS

Substitute V11. Check T1, C67, R64 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V7 and V8. Check C62, C63, R57, R59, R61 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V11. Check vertical integrator network. Check T1, C66, R1 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V12. Check C69, C74, C71, R2, R74, R72, R78 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V8 and V12. Check components associated with V12.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C49, C52, C2C, R46, R47 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A8. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check C49, C52, L31, L28, L32, R47 and other associated components.

NEGATIVE PICTURE

Substitute V7. Check picture tube. Check C49, C52 and other associated components.

SMEAR

Substitute V7. Check video detector network assembly. Check C49, C52, L32, L31 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9 and V10. Check stage V10 using audio signal generator. Apply audio signal across R3.

If Satisfactory	If Unsatisfactory
Check audio detector and audio IF stages for component failure or change of value.	Check C56, C59, C60, C61, R51, R52, R53, T5, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments A9 and R8 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check R86 and all tubes as they are in series. Check AC interlock assembly. Check switch on volume control. If filaments light, check M1, M2, R88 and C1. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check M1, M2, R88 and C1. Check B+ filter and decoupling network.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Osc.	2AF4	2AF4	7DK	2T4 used as alternate.
V2	RF Amp.	3BC5	3BC5	7BD	
V3	Mixer-Osc.	5U8	5U8	9AE	
V4	1st Video IF Amp.	3CB6	3CB6	7CM	
V5	2nd Video IF Amp.	3CB6	3CB6	7CM	
V6	3rd Video IF Amp.-Video Det.	5AV8	5AV8		
V7	Video Output-Sync Sep.	6AW8	6AW8	9DX	
V8	Sound IF Amp.-Sync Amp.	5AV8	5AV8		
V9	Audio Detector	3BN6	3BN6	7DF	
V10	Audio Output	12L6GT	12L6GT	7S	
V11	Vert. Osc.-Vert. Output	12BH7A	12BH7A	9A	
V12	Horiz. AFC-Horiz. Osc.	6SN7GTB	6SN7GTB	8BD	
V13	Horiz. Output	12CU6	12CU6	6AM	
V14	Damper	12AX4GTA	12AX4GTA	4CG	
V15	HV Rectifier	1X2B	1X2B	9Y	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: CROSLEY PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V16	17AVP4	17AVP4		17AVP4 17AVP4A②		12L	① Aluminized ②Silver screen
	21ATP4 ①	21ATP4①	21ATP4①	21ATP4②	21ATP4①	12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CROSLEY PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
C1	200	200	158557-1			ST-122	TD-200-200	D-100	Note 1
C2A	140	300	157838-3			TCQ4187	CDB1008	Q-162	Red
B	200	150							Green
C	5	300							Blue
D	30	150							Yellow
C3A	200	150	157836-1			TCD2161	TDL-205	D-088	Red
B	5	150							Yellow
C4	20	450	157903-1			TC75	TD-20-450	FM-4520	
C5	470	1000	137499-36	DD-471	1R5KV-471	MCL347		K-2347	
C6	470	1000	137499-36	DD-471	1R5KV-471	MCL347		K-2347	
C7	470	1000	137499-36	DD-471	1R5KV-471	MCL347		K-2347	
C8	470	1000	137499-36	DD-471	1R5KV-471	MCL347		K-2347	
C9	15			D6-150	GP1K-150	UC-5415			
C10	33			D6-330	GP1K-330	UC-5433			
C11	2			TCZ-2	NP0A-020				
C12	1000			DD-102	801-001	DC-521			
C13	1000			DD-102	801-001	DC-521			
C14	1000			DD-102	801-001	DC-521			
C15	1000			DD-102	801-001	DC-521			
C16	.33								
C17	.56								
C18	.91			TCZ-1	NP0A-010				
C19	15			D6-150	GP1K-150	UC-5415			
C20	1.2			TCZ-1R2	NP0A-1R2	ZT-5515			
C21	10								
C22	100			D6-101	GP1K-101	UC-531			
C23	1.5								
C24	1000			DD-102	801-001	DC-521			
C25	1000			DD-102	801-001	DC-521			
C26	5								
C27	75			TCZ-75	NP0-337-750	ZT-5475			
C28	1000			DD-102	801-001	DC-521			
C29	1000			MFT-1000					
C30	1000			DD-102	801-001	DC-521			
C31	1000			MFT-1000					
C32	1000			DD-102	801-001	DC-521			
C33	1000			MFT-1000					
C34	1000			DD-102	801-001	DC-521			
C35	1000			MFT-1000					
C36	.1	400	39478-47	DF-104		PT401	IMP4-P1	330401	Note 3
C37	5000		144675-30	DD-502	811-005	DC-525		C-1250	Note 2
C38	750		156201-5	DD-751	811-751	UC-5375		K-1375	
C39	1500		144675-30	DD-751	811-751	UC-5375		K-1375	
C40	750		156201-5	DD-751	811-751	UC-5375		K-1375	
C41	1500		144675-30	DD-152	801-0015	DC-5215		C-1215	Note 3
C42	47	500	137499-55	TCZ-47	NP0-338-470	MCB225		KR-1447	Note 4
C43	750		156201-5	DD-751	811-751	UC-5375		K-1375	
C44	750		156201-5	DD-751	811-751	UC-5375		K-1375	
C45	1500		144675-30	DD-152	801-0015	DC-5215		C-1215	
C46	10		137727-135	D6-100	GP1K-100	UC-541		K-1410	
C47	5		137727-103	D6-050	GP1K-050	ZT-555		K-1550	
C48	.25	100	157810-1			PT4025	IMP2-P25	3302025	
C49	.1	150	157906-1	DF-104		PT401	IMP2-P1	330201	
C50	33		137727-126						
C51	68		137727-133						
C52	.1	400	39478-47	DF-104		PT401	IMP4-P1	330401	
C53	5000		144675-2	DD-502	811-005	DC-525		C-1250	
C54	.01	200	39478-41	D6-103	GP2-333-103	PT411	IMP4-S1	330411	
C55	33		137727-126						
C56	5000		144675-2	DD-502	811-005	DC-525		C-1250	
C57	10000		39478-41	DD-103	811-01	DC-511			
C58	15		137727-43						
C59	1300		144675-33	D6-122	GP2L-122	UC-5212		C-1213	Note 5
C60	.02	200	39001-80	DF-203	817-02	PT412	IMP2-S2	330212	
C61	.02	200	39001-80	DF-203	817-02	PT412	IMP2-S2	330212	Note 7
C62A	270				GP2K-271	UC-5327		K-1327	
B	10000		†157813-1	†PC-262	811-01	DC-511		IMP6-S1	
C	25				GP1K-250	UC-5425		K-1425	

CROSLEY MODELS H-177OBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)

PROPERTY OF
L. F. BLANKENSHIP
3914 MERCE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA CROSLEY Part No.	CENTRALAB Part No.	ERIE Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.
C83	.05	300	23001-17	DF-503		PT415	IMP2-S5	330215
C84A	5000		4S7813-1	4PC-106	811-006	DC-535	IMP5-D5	C-1250
B	5000				811-005	DC-535	IMP6-D5	C-1250
C85	.01	600	29475-41	D6-103	QXF3-333-103	PT411	IMP4-S1	330411
C86	560		146675-33	D6-561	811-561			KH-1356
C87	.047	400	29475-45					
C88	5000		166315-39	DD-502	811-006	DC-535	IMP5-D5	C-1250
C89	50		137727-81					
C90	.05	400	29001-17	DF-503		PT415	IMP4-S5	330415
C91	.02	300	29001-80	DF-303	817-03	PT413	IMP2-S2	330212
C92	.25	35	157810-1			PTM285	IMP3-P25	3302525
C73	33		137727-125					KH-1323
C74	220	500	137486-23	TCS-220	MPP-335-221	MCE240		
C75	.01	400	149113-3			PT415	IMP4-S5	330415
C76	1500		144675-33					KH-1213
C77	1500		144675-33					KH-1213
C78	.05	400	29001-17	DF-503		PT415	IMP4-S5	330415
C79	82	3000	155315-23	DD30-820	5KV-820			K-2482
C80	.01	600	29001-85					330518
C81	68	3000	155315-3	DD30-680	5KV-680	DD30468		
C82	1500		144675-30	DD-152	801-0015	DC-5215		C-1215
C83	1500		144675-30	DD-152	801-0015	DC-5215		C-1215
C84	1500		144675-30	DD-152	801-0015	DC-5215		C-1215
C85	1500		144675-30	DD-152	801-0015	DC-5215		C-1215
C88	5000			DD-502	811-006	DC-535		C-1250

Note 1. Some versions use 140MMFD in this application (part #157837-1).
When replacing, part #158557-1 (500MFD) may be used.
Note 2. Some versions may use 15000MMF in this application (part #144675-30).
Note 3. Not used in some versions.
Note 4. Some versions use 30MMF in this application.
Note 5. Some versions use 1000MMF in this application. (Part #158215-17)
Note 6. Chassis 442, 434 (code B) and 445 (code AX or BX) use 560MMF in this application (part #144675-32).
Note 7. Chassis 445 (code AX or BX) use .0068MFD in this application (part #39478-40).
† Items C82A, C82B, C82C, R56A, R56B and R56C are combined in one unit.
* Items C64A, C64B, R62A and R62B are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA CROSLEY Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1Meg with 350KΩ stop	½	B157806-1-3	4QH-136	4A47-750-S	B-59*	4U54	Vert. Hold
B	Shaft		Not Req.	Not Req.	Not Req.	Not Req.	Not Req.	Attach to R1A - Note 1
R2A	165KΩ with 70KΩ Stop	½	B157803-1-3	7QH-125	7A47-75K-S	YB35	U-47	Horiz. Hold
B	Shaft		Not Req.	Not Req.	Not Req.	Not Req.	Not Req.	Attach to R2A
R3A	330KΩ	½	B157803-4-3	Q13-133	A47-500K-2	B-50-S	U-46	Volume
B	Shaft		Not Req.	Not Req.	Not Req.	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	Not Req.	T6-1	Not Req.	SWS-12	Attach to R3A
R4A	1500Ω	½	B157804-12	Q17-109	A47-1500-S	AB-515	U-5	Contrast
B	Shaft		Not Req.	Not Req.	Not Req.	AK-3	Not REq.	Attach to R4A
R5A	5Meg.	½	B157810-1-3	Q17-141				Brightness
B	Shaft		Not Req.		SQ			Attach to R5A
R6A	750Ω	½	B157800-1-1	Q21-105	A47-750-S	AB-5	SU-4	Vert. Linearity
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	5Meg with 1Meg stop	½	B157806-1-1	Q21-141*	A47-5Meg-S*	AB-8**	SU-47*	Height
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8	500Ω	½	A157955-2-1		39-500			Buzz (Wire-wound)

* Connect a 330KΩ Resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)
† Connects 68KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down)
* Connect 1 Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)
Note 1-Chassis 434 and 446 may have an alternate control 170KΩ with a 70KΩstop part #B-157802-1-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CROSLEY Part No.	IRC Part No.	NOTES
R9	470KΩ	½		BTS-470K	
R10	470KΩ	½		BTS-470K	
R11	470KΩ	½	39274-57	BTS-470K	
R12	470KΩ	½	39274-57	BTS-470K	
R13	18kΩ	½		BTS-15K	
R14	2200Ω	½		BTS-2200	
R15	470Ω	½		BTS-470	
R16	10KΩ	½		BTS-10K	
R17	5600Ω	½		BTS-5600	
R18	470KΩ	½		BTS-470K	
R19	10KΩ	½		BTS-10K	
R20	10KΩ	½		BTS-10K	
R21	2200Ω	½		BTA-2200	
R22	2200Ω	½		BTA-2200	
R23	1800Ω	½		BTS-1800	
R24	100Ω	½		BTS-100	
R25	15KΩ	½		BTS-15K	
R26	330KΩ	½		BTS-330K	
R27	56Ω	½		BTS-56	
R28	220Ω	½		BTS-220	Note 1
R29	2200Ω	½	39274-29	BTS-2200	
R30	100Ω	½	39274-25	BTS-100	
R31	47Ω	½	39274-9	BTS-47	
R32	100Ω	½	39274-25	BTS-100	
R33	4700Ω	½	39274-45	BTS-4700	
R34	22KΩ5%	½	39275-81	BTS-22K 5%	
R35	100Ω	½	39274-25	BTS-100	
R36	56Ω	½	39274-10	BTS-56	
R37	100Ω	½	39274-25	BTS-100	
R38	22KΩ 5%	½	39275-81	BTS-22K 5%	
R39	150Ω	½	39274-15	BTS-150	
R40	100Ω	½	39274-25	BTS-100	
R41	100Ω	½	39274-25	BTS-100	
R42	1Meg	½	39274-61	BTS-1Meg	
R43	5600Ω	½	39274-34	BTS-5600	
R44	1Meg	½	39274-61	BTS-1Meg	
R45	47Ω	½	39274-36	BTS-47Ω	
R46	33KΩ	1	39274-131	BTA-33K	
R47	470KΩ	3			
R48	100KΩ	½	39274-49	BTS-100K	
R49	15Ω	½	39274-15	BTS-150	
R50	18KΩ	½	39274-60	BTS-18K	
R51	5600Ω	½	39274-123	BTA-5600	
R52	470Ω	½	39274-21	BTS-470	
R53	470KΩ	½	39274-57	BTS-470K	
R54	560KΩ	½	39274-58	BTS-560K	
R55	8300Ω	½	39274-38	BTS-8300	
R56A	10KΩ	*		BTS-10K	
B	220KΩ	*	41S7813-1	BTS-220K	
C	2. 2Meg	*		BTS-2. 2Meg	
R57	1Meg	½	39274-61	BTS-1Meg	
R58	47KΩ	½	39274-46	BTS-47K	
R59	6800Ω	½	39274-35	BTS-6800	
R60	680KΩ	½	39274-59	BTS-680K	

† Items R56A, R56B, R56C, C62A, C62B and C62C are combined in one unit.
* Items R62A, R62B, C64A, C64B are combined in one unit.
Note 1: Chassis 434 code C uses a 100Ω resistor in this application. Not used in some versions of chassis 441 & 442.
Note 2: Some versions use a 560Ω 3 watt resistor in this application.
Note 3: Not used in chassis 441.
Note 4: Chassis 442, 434 and 445 use a 7500Ω resistor in this application.
Note 5: Not used in chassis 442, chassis 434 code A and chassis 445.
Note 6: At normal room temperature resistance is 145Ω, when hot, resistance is 40Ω.
Note 7: Chassis 434 uses a 45Ω 20 watt resistor in this application.
Note 8: Not used in chassis 434.
Note 9: Not used in chassis 445.

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CROSLEY Part No.	IRC Part No.	NOTES
R61	4700Ω	½	39274-53	BTS-4700	
R62A	22KΩ	½	41S7812-1	BTS-22K	
B	100KΩ	½		BTS-10K	
R63	68KΩ	½	39274-47	BTS-68K	Note 3
R64	68000Ω	3			Note 4
R65	390KΩ	½	39274-56	BTS-390K	
R66	820KΩ	½	39274-60	BTS-820K	
R67	470KΩ	½	39274-57	BTS-470K	
R68	680Ω	½	39274-23	BTS-680	
R69	68Ω	½	39274-23	BTS-680	
R70	560KΩ	½	39274-58	BTS-560K	
R71	150KΩ	½	39274-51	BTS-150K	
R72	150KΩ	½	39274-51	BTS-150K	
R73	8200Ω	½	39274-35	BTS 8200	
R74	100KΩ	½	39274-49	BTS-100K	
R75	1000Ω	½	39274-25	BTS-1000	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CROSLEY Part No.	IRC Part No.	NOTES
R76	2. 7Meg	½	39274-71	BTS-2. 7Meg	
R77	100KΩ	½	39274-49	BTS-100K	
R78	18KΩ	½	39274-60	BTS-18K	
R79	27KΩ	½	39274-62	BTS-27K	
R80	150KΩ	½	39274-51	BTS-150K	
R81	470KΩ	½	39274-57	BTS-470K	
R82	100Ω	½	39274-14	BTS-100	
R83	33Ω	1			
R84	12KΩ	3	156511-5		
R85	4700Ω	½	39274-53	BTS-4700	
R86A	25Ω	20	158850-1		Note 7
B	25Ω	20			Note 7
R87	*	1	158849-1		Note 8 & 8
R88	7. 5Ω	5	154087-1		
R89	33KΩ	1		BTA-33K	
R90	220KΩ	½			Note 9

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA CROSLEY Part No.	Hallderson Part No.	Merit Part No.	RCA Part No.	Ram Part No.	Stancor TYPE No.	Thordarson Part No.	Tried Part No
T1	Vert. Osc. Trans.	156255-3	B6702	A-3003		V405	A-8125	26A03	A-97X
T2	Horiz. Output Trans.	158481-3-5 ①	FB418 *			X'23	A-8263 *	FLY-25 *	D-48 *
		158481-3 ② ③							
		158481-5 ① ④							
T3	Vert. Output Trans.	158477-1 ⑥							
		158726-1 ⑤							
		154726-1 ⑥							
T4A	Yoke (90°) Horiz. (24MH)	158430-1-3 ⑦	DF607 ⑦				DY-16A ⑦ ⑩	Y-16 ⑦ ⑩	Y-41-1 ⑦ ⑩
B	Vert. (40MH) ⑦⑧	158426-1 ⑦⑧	⑩ ⑪				⑩ ⑪	⑩ ⑪	⑩ ⑪

① Complete assembly. Includes: Trans. windings (Crosley part #158483-1)
Trans. core (2 used) (Crosley part #158473-1)
Mounting board (Crosley part #158405-1)
Core Spring (Crosley part #158408-1)
Term. Board (Crosley part #158475-1).
② Replacement for 21" chassis only.
③ May be used as replacement for both 17" or 21" chassis.
④ Used in chassis 441 only.
⑤ Used in chassis 442 and 445.
⑥ Used in chassis 434 only.
⑦ Includes capacitor C81, resistors R68 and R69. Does not include rear cover and centering device(Crosley part #153586-1).
⑧ To mount replacement same as original (leads out top) loosen and rotate core clamp 180 degrees in this position. Connect horizontal damping capacitor across terminals #1 and #2, and jumper terminals #3 and #5. To mount replacement with leads out bottom, connect horizontal damping capacitor across terminals #3 and #7, and jumper terminals #1 and #8.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Hallderson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Tried Replacement Connections
7	7				7	7	7
6	6				6	5	6
3	3				3	3	3
5	5				5	5	5
2	2				2	2	2

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA CROSLEY Part No.	Hallderson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No.	NOTES
T5	2.2KΩ	3.7Ω	157919-1-3	21066 ①	A-3025		24S50 ②		① Alternate audio output trans. ② Drill one new mounting hole.
			157919-1 ①						
			158785-1 ②						

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP	REPLACEMENT DATA CROSLEY Part No.	QUAM Part No.	NOTES
SP1	4"	PM	3.7Ω	157898-1-④	4A07	① Used in 17" table models
		PM	3.7Ω	157703-2 ②		② Alternate 4" PM speaker
	5"	PM	3.7Ω	158733-1 ③	5A1	③ Used in 21" table models
	6"	PM	3.7Ω	158633-1 ④	6A21	④ Used in COM series
	8" x 12"	PM	3.7Ω	158734-1 ⑤		⑤ Used in COR and RC series

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CROSLEY Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1	VHF Ant. Match. Trans.	.5Ω						
L2	VHF Ant. Match. Trans.	.5Ω						
L3	RF Choke	0Ω						
L4	RF Choke	0Ω						
L5	RF Choke	0Ω						
L6	VHF Ant. Coil	0Ω						Channel 13
L7	VHF Ant. Coil	0Ω						Channel 13
L8	UHF IF Coupling Coil	0Ω						
L9	RF Choke	0Ω						
L10	FIL. Choke	0Ω						
L11	VHF RF Coil	0Ω						Channel 13
L12	VHF RF Coil	0Ω						
L13	VHF Mixer Grid Coil	0Ω						Channel 13
L14	VHF Mixer Grid Coils	0Ω						
L15	RF Choke	0Ω						
L16	FIL. Choke	0Ω						
L17	VHF Osc. Coil	0Ω						Channel 13
L18	RF Coil	0Ω						
L19	VHF Osc. Coils	0Ω						
L20	VHF Osc. Coil	0Ω						Channel 6
L21	RF Choke	1.3Ω						
L22	Conv. Plate	.1Ω						
L23	1st. Video IF	.1Ω		157718-1	I7-4504 *	TV-128 ⑩	6318 *	Includes 47.25MC Trap- Note 1
L24	2nd. Video IF	.1Ω	.1Ω	158588-1	I7-4534	TV-130	6219	
L25	Fil. Choke	0Ω		158704-1	I9-1000		4602	1 Microhenry
L26	3rd. Video IF	.1Ω	.1Ω	158615-1			6231	Includes 41.25MC trap
L27	4th. Video IF	.1Ω	.1Ω	158721-1	I7-5004 ▲	TV-129 *	6134▲	
L28	Series Peaking Coil	1.8Ω		158699-1	I0-1005		4613	8 Microhenries
L29	Shunt Peaking Coil	1TΩ		159210-1	I0-1500		6146	875 Microhenries
L30A	4.5MC Trap	3.6Ω						
B	Fil. Bound IF	.8Ω		157841-1				
L31	Shunt Peaking Coil	23Ω		156638-1	I7-3500 ▲		6144 ▲	565 Microhenries, wound on 4.7KΩ resistor Note 2
L32	Series Peaking Coil	10Ω		156630-1	I9-3250 †	TV-126 †	6181 †	350 Microhenries, wound on 27KΩ resistor Note 3
L33	2nd. Sound IF	1.6Ω	3Ω	157856-1				
L34	Quadrature Coil	8.8Ω		157843-1	I0-1005	TV-131	1490	
L35	Horiz. Osc.	85Ω	85Ω	157781-1	I0-1403 ø	TV-123 ø	6183 ø	Waveform winding -43Ω

Note 1. Some versions use alternate part #159028-1.
Note 2. Some versions use 585 microhenries wound on 6.8KΩ resistor.
Note 3. Some versions use 350 microhenries wound on 33KΩ resistor.
* Use one winding only.
▲ Cut out chassis hole and use adaptor plate. Use one winding only.
▲ Use adaptor plate and drill mounting holes.
ø Use adaptor plate and drill mounting holes and detune trap.
† Parallel with 4.7KΩ resistor.
ø Parallel with 27KΩ resistor.
Reverse coil mounting is can.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA CROSLEY Part No.	Hallderson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Tried Part No
L36	.19MA	96Ω	1.06 Hy.	155529-1-2	C6040	C-3994	C-233T	36C41	C-23X ①
				155529-1 ②					

① Alternate filter choke.
② Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA CROSLEY Part No.	FEDERAL Part No.	INTERNATIONAL Part No.	MALLORY Part No.	RADIO RECEPTOR Part No.	SARKES TARZIAN Part No.	NOTES
M1	.198A	C-155575-2-1	1336A	RS250	6S300	6Q4	300	① Alternate Sel. Rectifiers
		C-155573-2 ①						
M3	.198A	C-155575-2-1	1336A	RS250	6S300	6Q4	300	
		C-155573-2 ①						

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA CROSLEY Part No.	SYLVANIA Part No.	NOTES
M3	1N82A *	158186-31	1N83 or 1N82A	USE Mixer

* Some versions may use ST-47 type crystal diode in this application, (Crosley part #158898-1).

CROSLEY MODELS H-17TOMH, TOMHU, TOMWH, H-21CORMH, CORHU, COMWH, COMWU, CORMH, CORHU, CORWH, TOMH, TOMU, TOMWH, TOMWU, HCMH, HCMU, HCWH, HCWU, HPMH, HPMU, TOMH, TOMU, TOMWH, TOMWU (Ch. 434, 441, 442, 445)

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IPTIONS (Continued)

nt)

	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CROSLEY PART No.	IRC PART No.	
	2.7Meg	½	39374-71	BTS-2.7Meg	
	100KΩ	½	39374-49	BTS-100K	
	18KΩ	½	39374-40	BTS-18K	
	27KΩ	½	39374-42	BTS-27K	
	150KΩ	½	39374-51	BTS-150K	
	470KΩ	½	39374-57	BTS-470K	
	100Ω	½	39374-14	BTS-100	
	22Ω	1			Note 5
	12KΩ	3	156911-5		
	4700Ω	½	39374-33	BTS-4700	
A	25Ω	20	158850-1		Note 7
B	25Ω	20			Note 7
	*	1	158849-1		Note 6 & 8
	7.5Ω	5	154087-1		
	33KΩ	1		BTA-33K	
	220KΩ	½			Note 9

ined in one unit.

plication. Not used in some versions of chassis 441 & 442.
application.

his application.
assis 445.
when hot, resistance is 40Ω.
plication.

EP CIRCUITS)

PLACEMENT DATA				
RCA ART No.	Ram PART No.	Stancor TYPE No.	Thordarson PART No.	Triad PART No.
	V405	A-8125	26A03	A-97X
	X123	A-8263 *	FLY-25 *	D-48 *
		DY-16A ⑨ ⑩ ⑪	Y-16 ⑨ ⑩ ⑪	Y-41-1 ⑨ ⑩ ⑪

583-1)
t #158473-1)
-05-1)
-1)
5-1).

ear cover and centering device(Crosley part #153586-1).

otate core clamp 180 degrees in this position.
id jumper terminals #3 and #5. To mount
itor across terminals #3 and #7, and jumper

ER CONNECTION DATA

ment Type is Listed

Ram acement nections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	7	7	7
	6	6	6
	3	3	3
	5	5	5
	2	2	2

DIO OUTPUT)

r o.	Thordarson PART No.	Triad PART No.	NOTES
	24S50 ②		① Alternate audio output trans. ② Drill one new mounting hole.

NOTES
Used in 17" table models
Alternate 4" PM speaker
Used in 21" table models
Used in COM series
Used in COS and HC series

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CROSLEY PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	VHF Ant. Match. Trans	.5Ω						
L2	VHF Ant. Match. Trans.	.5Ω						
L3	RF Choke	0Ω						
L4	RF Choke	0Ω						
L5	RF Choke	0Ω						
L6	VHF Ant. Coil	0Ω						Channel 13
L7	VHF Ant. Coil	0Ω						
L8	UHF IF Coupling Coil	0Ω						
L9	RF Choke	0Ω						
L10	Fil. Choke	0Ω						
L11	VHF RF Coil	0Ω						Channel 13
L12	VHF RF Coil	0Ω						
L13	VHF Mixer Grid Coil	0Ω						Channel 13
L14	VHF Mixer Grid Coils	0Ω						
L15	RF Choke	0Ω						
L16	Fil. Choke	0Ω						
L17	VHF Osc. Coil	0Ω						Channel 13
L18	RF Coil	0Ω						
L19	VHF Osc. Coils	0Ω						
L20	VHF Osc. Coil	0Ω						Channel 6
L21	RF Choke	1.3Ω						
L22	Conv. Plate	.1Ω						
L23	1st. Video IF	.1Ω		157718-1	17-4504 *	TV-128 ■	6218 *	Includes 47.25MC Trap-Note 1
L24	2nd. Video IF	.1Ω	.1Ω	158586-1	17-4524	TV-130	6219	
L25	Fil. Choke	0Ω		158704-1	19-1000		4602	1 Microhenry
L26	3rd. Video IF	.1Ω	.1Ω	158615-1			6221	Includes 41.25MC trap
L27	4th. Video IF	.1Ω	.1Ω	158721-1	17-5004 ▲	TV-129 ♦	6234▲	
L28	Series Peaking Coil	1.8Ω		158699-1	10-1005		4612	8 Microhenries
L29	Shunt Peaking Coil	17Ω		159210-1	19-3500		6144	575 Microhenries
L30A	4.5MC Trap	2.6Ω						
B	1st. Sound IF	.8Ω		157841-1				
L31	Shunt Peaking Coil	23Ω		158628-1	17-3500 ▬		6144 ▬	565 Microhenries, wound on 4.7KΩ resistor Note 2
L32	Series Peaking Coil	10Ω		158630-1	19-3250 †	TV-185 †	6181 †	250 Microhenries, wound on 27KΩ resistor Note 3
L33	2nd. Sound IF	1.6Ω	3Ω	157856-1				
L34	Quadrature Coil	4.8Ω		157842-1	20-1005	TV-151	1480	
L35	Horiz. Osc.	25Ω	53Ω	157791-1	20-1402 #	TV-162 #	6183 #	Waveform winding -42Ω

Note 1. Some versions use alternate part #159029-1.
Note 2. Some versions use 565 microhenries wound on 6.8KΩ resistor.
Note 3. Some versions use 250 microhenries wound on 33KΩ resistor.
* Use one winding only.
■ Cut out chassis hole and use adaptor plate. Use one winding only.
▲ Use adaptor plate and drill mounting holes.
♦ Use adaptor plate and drill mounting holes and detune trap.
▬ Parallel with 4.7KΩ resistor.
† Parallel with 27KΩ resistor.
# Reverse coil mounting in can.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA CROSLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L36	.198A	56Ω	1.06 Hy.	155529-1-2 155529-1 ①	C5040	C-2994	C-2327	26C41	C-21X ②

① Alternate filter choke.
② Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA CROSLEY PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.198A	C-155575-2-1 C-155572-2 ①	1236A	RS250	6S300	6Q4	300	① Alternate Sel. Rectifiers
M2	.198A	C-155575-2-1 C-155572-2 ①	1236A	RS250	6S300	6Q4	300	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA CROSLEY PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M3	1N82A *	158186-21	1N82 or 1N82A	UHF Mixer

* Some versions may use ST-47 type crystal diode in this application, (Crosley part #158898-1).

CROSLEY MODELS H-17TOBUc, TOMUc, TOWUc, H-21COBHb, COBUc, COMHb, COMUc, COSBHb, COSBUc, COSHb, COSUc, COWHb, COWUc, HCBHb, HCBUc, HCMHb, HCMUc, HCWHb, HCWUc, HPBUc, HPWUc, TOBHb, TOBUc, TOMHb, TOMUc, TOWHb, TOWUc (Ch. 434, 441, 442, 445)

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M4	Pilot Light	138437-1	#47, Chassis 441, 442, 445 only
M5	Tuner	D-158692	VHF-UHF combination - Chassis 441, 442, 445. Consists of VHF tuner part #159027-1 and UHF tuner part #159027-2
M6	Tuner	158673	VHF - Chassis 434 only
M7	Switch	158799-1	TV-phono - Chassis 445 only
M8	Switch	148884-203	On-off (phono) - Chassis 445 only
M9	Centering Device		Part of yoke cover
M10	Ion Trap	153109-2	
B3	Trimmer Cap.	157870-1	Horiz. Lock (10-160MMF)
	Cabinet	158595-1	Less base - Models H-21TOMHb, H-21TOMUc
	Cabinet	158595-2	Less base - Models H-21TOBHb, H-21TOBUc
	Cabinet	158595-3	Less base - Models H-21TOWHb, H-21TOWUc,
	Cabinet	158601-1	Less shelf and grille bars - Models H-21COSHb, H-21COSUc, H-21COMHb, H-21COMUc
	Cabinet	158601-2	Less shelf and grille bars - Models H-21COSBHb, H-21COSBUc, H-21COBHb, H-21COBUc
	Cabinet	158601-3	Less sheft and grille ornament - Models H-21COWHb and H-21COWUc
	Cabinet	158605-1	Models H-21HCMHb, H-21HCMUc
	Cabinet	158605-3	Models H-21HCWHb, H-21HCWUc
	Cabinet	158605-2	Models H-21HCBHb, H-21HCBUc
	Cabinet	158741-2	Model H-21HPBUc
	Cabinet	158741-3	Model H-21HPWUc
	Base	158596-1	Cabinet - Models H-21TOMHb, H-21TOMUc, H-21TOBHb, H-21TOBUc, H-21TOWHb, H-21TOWUc
	Grille Bar	158789-1	2 used - Models H-21COSHb, H-21COSUc
	Grille Bar	158789-2	2 used - Models H-21COSBHb, H-21COSBUc
	Knob	157753-4	VHF channel selector - Chassis 434 - All models
	Knob	158694-1	VHF Channel selector - Models H-17TOMUc, H-17TOBUc, H-17TOWUc
	Knob	158794-2	VHF Channel Selector - Chassis 442 - All models
	Knob	158694-2	VHF Channel Selector - Models H-21HPBUc, H-21HPWUc,
	Knob	157750-1	Control (4 used) - Chassis 434, 441, 442 - All models
	Knob	157750-1	Control (7 used) - Chassis 445 - All models
	Knob	157754-1	VHF Fine Tuning - Chassis 434 - All models
	Knob	158735-1	VHF Fine Tuning - Chassis 441, 442, 445 - All models
	Knob	158740-1	UHF Tuning - Chassis 441, 442, 445 - All models
	Dialq	158723-1	UHF Channel Indicator - Chassis 441, 442, 445 - All models
	Safety Glass	155350-18	Chassis 434, 442, 445 - All models
	Safety Glass	155350-19	Chassis 441 - All models
	Mask	158419-2	Chassis 434, 442, 445 - All models
	Mask	158260-4	Chassis 441 - All models

PRODUCTION CHANGES

Ch. 434 (Code A, B) Ch. 445 (Code A)	TO IMPROVE INTERLACE In early production of chassis 434 and 445, R28 was 100Ω. C67 was connected from the yellow lead of the vertical oscillator transformer (T1) to ground. An additional 20MFD electrolytic capacitor was connected from the junction of the center arm of R6 (vertical linearity control) and C2D to boost (520V). Later to improve interlace the circuit was revised. Both versions are shown on the schematic.
Ch. 434 (Code C)	TO REDUCE REGENERATION R28 (100Ω, ½ watt) was added in the B+ line feeding the tuner to reduce regeneration when the built-in antenna is used.
Ch. 434, 441, 442, 445	SOUND TRAP ADJUSTMENT In early production L23 was provided with a 47.25MC trap winding. This trap is for areas where adjacent sound channel interference is noticeable. This trap is not prealigned at the factory and must be set in the field. Later this trap was omitted, however, it may be ordered under part #159061-1.

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TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V12, V13, V14 and V15. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C79, C78, C80, R84, R83 and other associated components.	Check L35, C70, C73, C74, C76, C77, R79, R74, R78 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V13 and V14. Check M1, M2, C77, C1, R88, R84, T2, T4A and other associated components.

BLOOMING

Check by substitution V13, V14 and V15. Check M1, M2, C1, C77, R88, R84 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V2, V3, V4, V5, V6, V7 and V10. Check video IF components for failure or change of value. Raster, No Sound, No Picture UHF, substitute V1.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

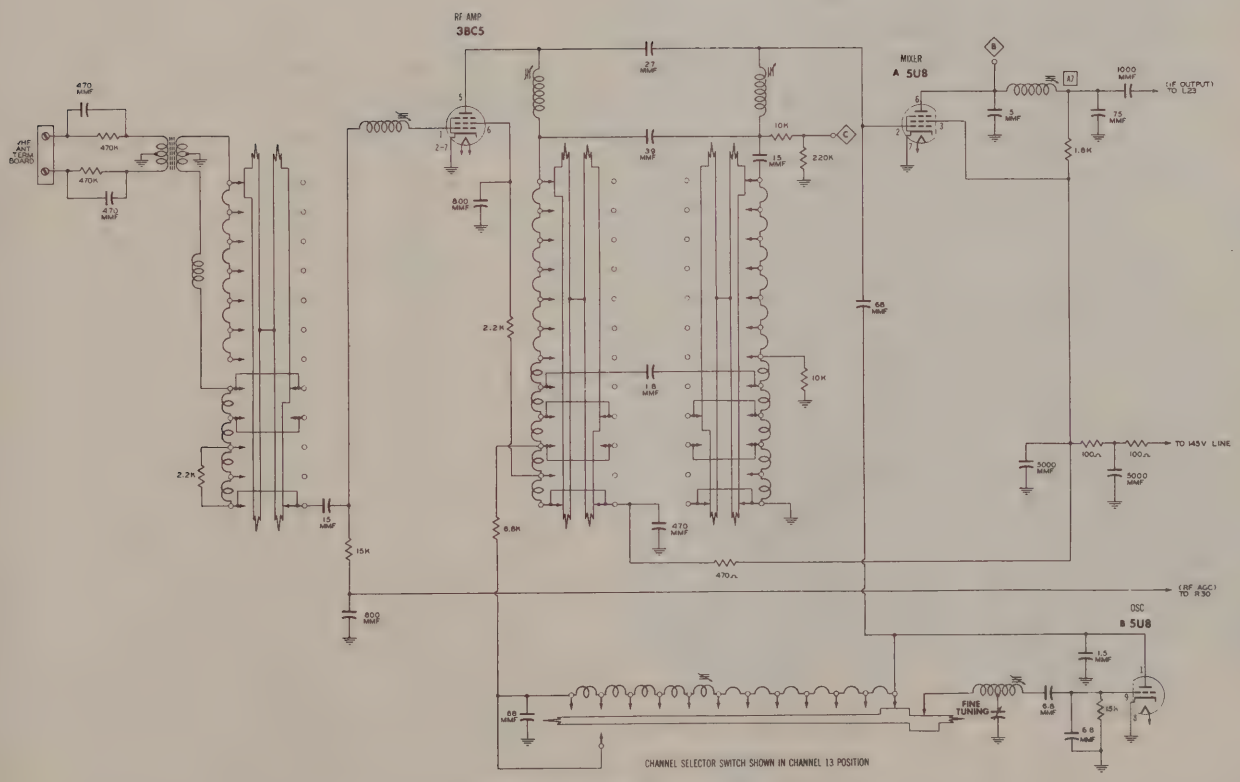
KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



VHF TUNER PART NO. 158673 USED WITH CHASSIS 434

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALTERNATE TUNER SCHEMATIC

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

The oscillator portion of this receiver has been properly aligned at the factory and is very stable. Alignment of of this portion is not recommended in the field.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 3 wood screws holding metal strip at the bottom of safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L35) until the picture synchronizes horizontally .

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to set. Adjust the buzz control (R8) for minimum buzz and maximum volume.

CENTERING

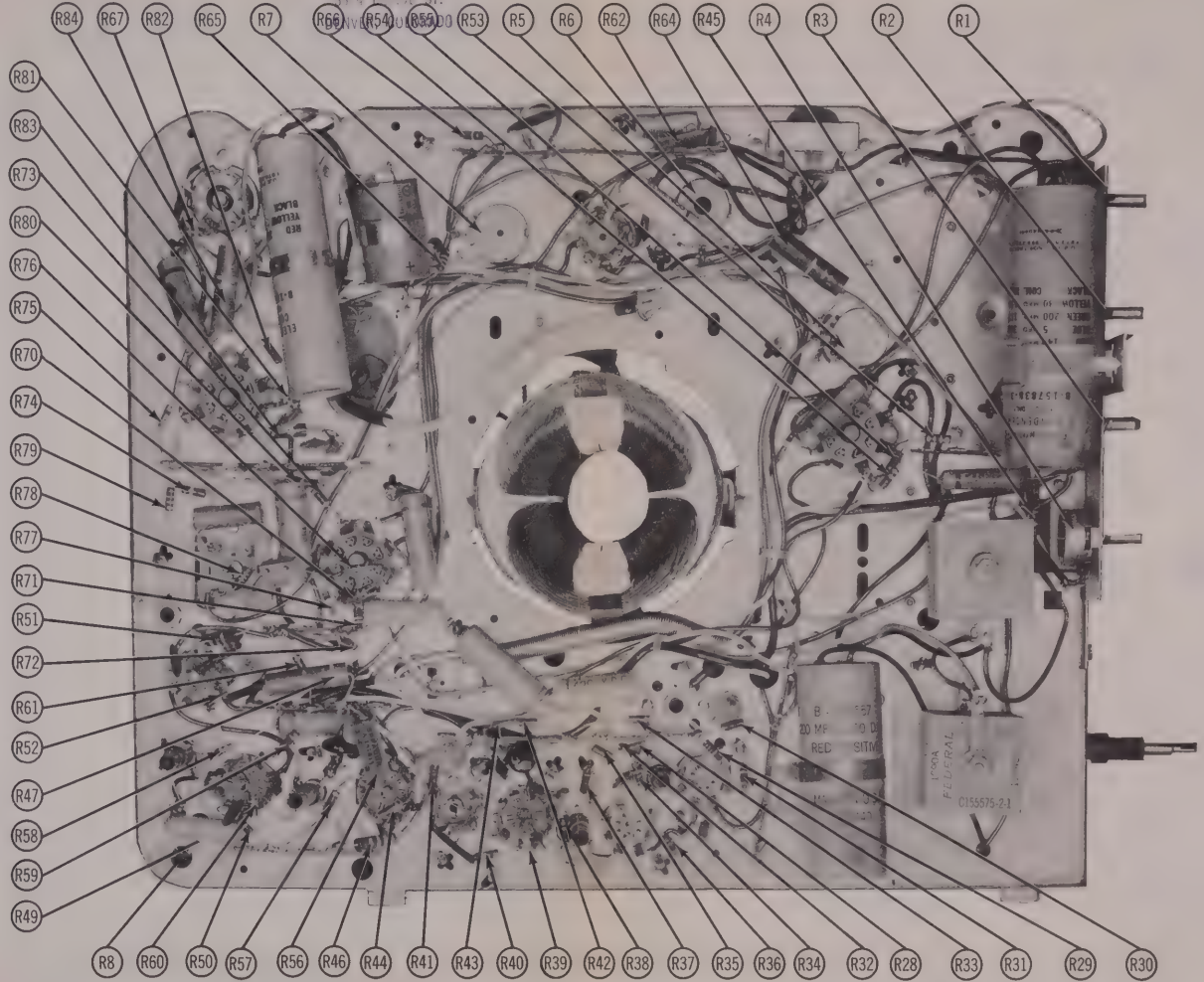
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

REMOVAL OF CABINET FROM MOUNTING BOARD

1. Remove 6 push-on type control knobs from side panel of cabinet.
2. Remove 4 wood screws. Remove rear cover.
3. Disconnect speaker leads. Remove 2 speaker nuts. Remove speaker.
4. Remove 1 wood screw holding antenna bracket.
5. Remove 2 wood screws on inside rear corners that hold the cabinet base to the wood supports on the bottom of each side and the 2 screws holding chassis to the wood strip on the inside of the cabinet above chassis.
6. Remove 6 cabinet bolts on the bottom, along sides; also 1 wood screw at the front center of the cabinet bottom.
7. Lift cabinet straight up off of cabinet mounting board.

PROPERTY OF



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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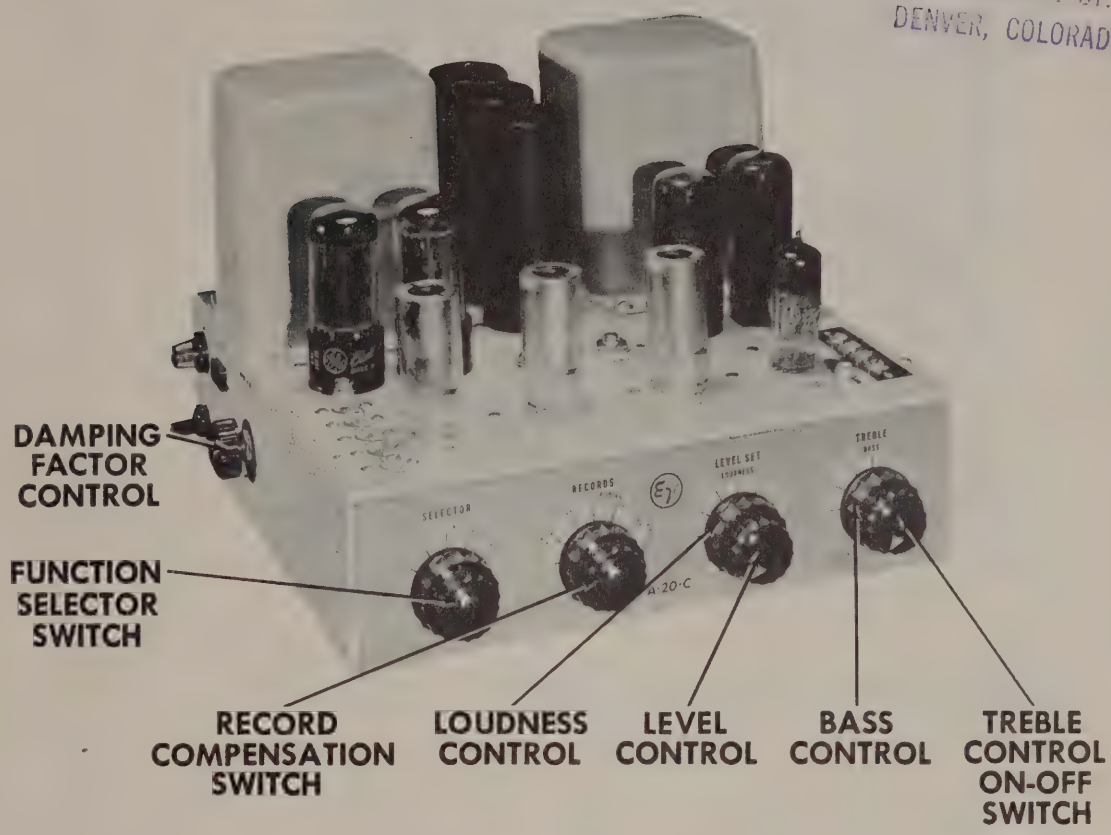
ELECTRO-VOICE
MODEL A-20C



ELECTRO-VOICE
MODEL A-20C

TRADE NAME	Electro-Voice Model A-20C
MANUFACTURER	Electro-Voice, Inc., Buchanan, Mich.
TYPE SET	AC Operated 5 Channel 20 Watt Audio Amplifier
TUBES (Eight)	Types 12AX7 Preamp.-AF Amp., 12AX7 Preamp.-AF Amp., 12AX7 AF Amp.-Phase Inverter, 12BH7 Driver, (2) 6V6GT Output, (2) 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .78 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Electro-Voice PART No.	STANDARD REPLACEMENT		
V1	Preamp.- AF Amplifier	12AX7	12AX7	9A	
V2	Preamp.- AF Amplifier	12AX7	12AX7	9A	
V3	AF Amp.- Phase Inverter	12AX7	12AX7	9A	
V4	Driver	12BH7	12BH7	9A	
V5	Output	6V6GT	6V6GT	7S	
V6	Output	6V6GT	6V6GT	7S	
V7	Rectifier	5Y3GT	5Y3GT	5T	
V8	Rectifier	5Y3GT	5Y3GT	5T	

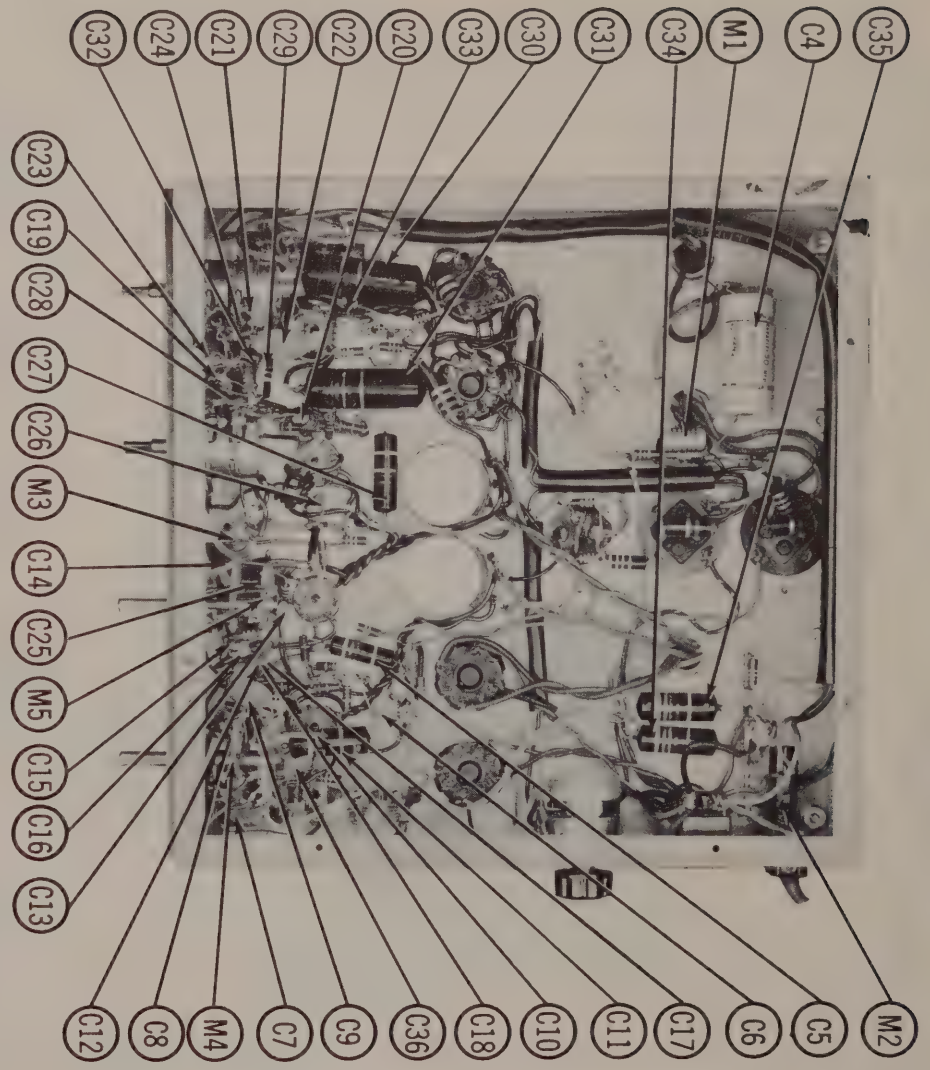
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	Electro-Voice PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲40	500	4247			FP288	TM-D40-500	D275	
B	▲40	500							
C2A	▲40	500	4247			FP288	TM-D40-500	D275	
B	▲40	500							
C3A	▲40	375	4267			FP377	TM-T40-450	T170	
B	■40	375							
C	▲40	375							
C4	50	100	4242			TC49	TD-50-150	MT-1550	
C5	.0047	400	4261	D6-472	GP2-333-472	PT4247	IMP4-D47	3304247	
C6	2000		4259	DD-202	811-002	DC-522			
C7	10000		4252	DD-103	811-01	DC-511			
C8	10000		4252	DD-103	811-01	DC-511			
C9	10000		4252	DD-103	811-01	DC-511			
C10	10000		4252	DD-103	811-01	DC-511			
C11	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C12	10000		4257	DD-103	811-01	DC-511			
C13	800		4253	DD-801	812-0008	DC-538			
C14	1000		4258	DD-102	811-001	DC-521			
C15	50			D6-500	GP1K-500	UC-545			Note 2
C16	50			D6-500	GP1K-500	UC-545			Note 2
C17	1500		4254	DD-152	GP2L-152	DC-5215			
C18	1000		4258	DD-102	811-001	DC-521			
C19	270		4255	D6-271	GP2K-271	UC-5327			
C20	.0068	400	4262	D6-682	GP2-333-682	PT4268	IMP4-D68	3304268	
C21	1000		4258	DD-102	811-001	DC-521			
C22	10000		4257	DD-103	811-01	DC-511			
C23	200		4256	D6-201	GP2K-201	UC-532			
C24	2000		4259	DD-202	811-002	DC-522			
C25	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C26	100		4264	DD-101	GP2K-101	UC-531			Note 1
C27	.022	400	4260			PT4122	IMP4-S22	3304122	
C28	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C29	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C30	.1	600	4241	DF-104		PT601	IMP6-P1	330601	
C31	.1	600	4241	DF-104		PT601	IMP6-P1	330601	
C32	.022	400	4260			PT4122	IMP4-S22	3304122	
C33	10000		4252	DD-103	811-01	DC-511			
C34	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C35	.047	400	4243	DF-503		PT4147	IMP4-S47	3304147	
C36	2000			DD-202	811-002	DC-522			Note 2

Note 1. Some versions use a 50MMF in this application.
Note 2. Not used in some versions.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Electro-Voice PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	A4687			F1-52	UF16A	Treble - Panel
B	1Meg	½				RS-52	UR18A	Bass - Rear
C	Switch					KB-1	US-26	Attach to R1B
R2A	250KΩ	½	B4687				UF254A	Level - Panel
B	250KΩ	½					UR254A	Loudness - Rear
R3A	1Ω	2	A4686					Damping Factor -wirewound
B	1800Ω	2						
R4A	250Ω	2	B4686	WK-250	A43-300	VK-125	R250L	Hum 1 - wire-wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	250Ω	2	B4686	WK-250	A43-300	VK-125	R250L	Hum 2 - wirewound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R6	270KΩ	½	4669	BTS-270K	
R7	47KΩ	½	4668	BTS-47K	
R8	2200Ω	½	4676	BTS-2200	
R9	120KΩ	½	4670	BTS-120K	
R10	470KΩ	½	4650	BTS-47K	
R11	120KΩ	½	4670	BTS-120K	
R12	12Meg	½	4672	BTS-12Meg	
R13	180Ω	½	4667	BTS-180	
R14	120KΩ	½	4670	BTS-120K	
R15	1.8Meg	½	0473	BTS-1.8Meg	
R16	1200Ω	½	4658	BTS-1200	
R17	4700	½	4675	BTS-4700	
R18	47KΩ	½	4668	BTS-47K	
R19	33KΩ	½	4665	BTS-33K	
R20	33KΩ	½	4665	BTS-33K	
R21	120KΩ	½	4670	BTS-120K	
R22	47KΩ	½	4668	BTS-47K	
R23	47KΩ	½	4668	BTS-47K	
R24	330KΩ	½	4685	BTS-330K	
R25	270KΩ	½	4669	BTS-270K	
R26	270KΩ	½	4669	BTS-270K	
R27	1.2Meg	½	4656	BTS-1.2Meg	
R28	27KΩ	½	4651	BTS-27K	
R29	120KΩ	½	4670	BTS-120K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R30	12KΩ	½	4649	BTS-12K	
R31	120KΩ	½	4670	BTS-120K	
R32	1800Ω	½	4677	BTS-1800	
R33	180KΩ	½	4671	BTS-180K	
R34	270KΩ	½	4669	BTS-270K	
R35	1.2Meg	½	4656	BTS-1.2Meg	
R36	470Ω	½	4654	BTS-470	
R37	22KΩ	½	4678	BTS-22K	
R38	4700Ω	½	4675	BTS-4700	
R39	27KΩ	½	4651	BTS-27K	
R40	27KΩ	½	4651	BTS-27K	
R41	470KΩ	½	4650	BTS-470K	
R42	1200Ω	½	4658	BTS-1200	
R43	12KΩ	1	4679	BTB-12K	
R44	470KΩ	½	4650	BTS-470K	
R45	12KΩ	1	4679	BTB-12K	
R46	470KΩ	½	4650	BTS-470K	
R47	470KΩ	½	4650	BTS-470K	
R48	47KΩ	½	4668	BTS-47K	
R49	180Ω	½	4667	BTS-180	
R50	33KΩ	1	4666	BTA-33K	
R51	33KΩ	1	4666	BTA-33K	
R52	100Ω	2			
R53	100Ω	2			

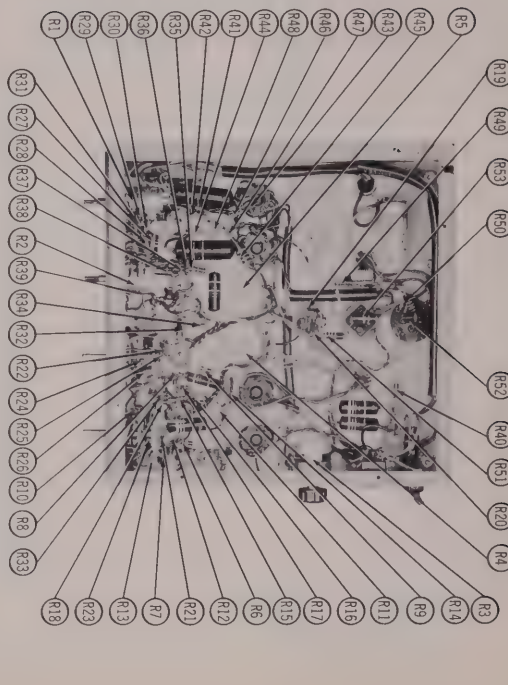
TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Electro-Voice PART No.	Hallidorson PART No.	Merrit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117VAC @ .78A	720VCT .037ADC	720VCT .037ADC	36VAC .001ADC						
	SEC. 4	SEC. 5	SEC. 6	SEC. 7						
	5VAC @2A	5VAC @2A	6.3VAC @.35A	6.3VAC @2.3A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Electro-Voice PART No.	Hallidorson PART No.	Merrit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2KΩ CT tap @ 1340 CT RES	16Ω tap @ 8Ω, 4Ω	1364						

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Electro-Voice PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.001ADC	5914	1199	CR10	8820 ①		10	① Drill mounting hole.

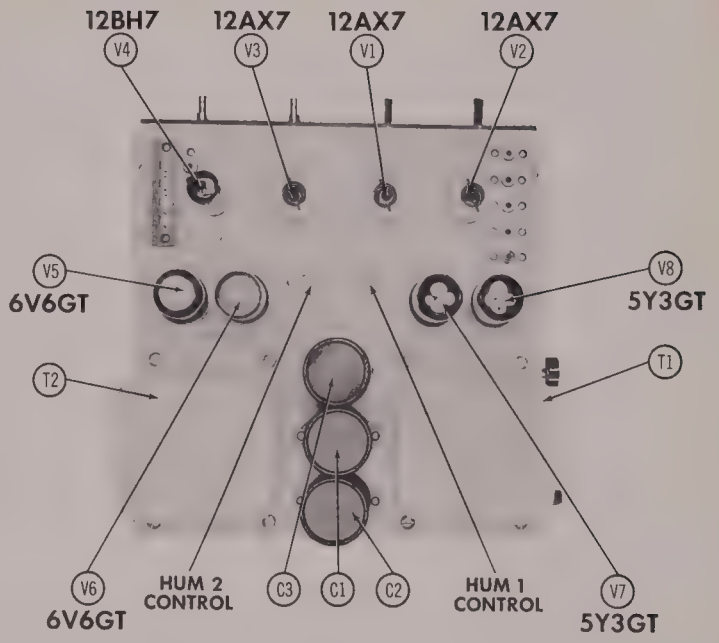
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Electro-Voice PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	1½A 125V	20171		31301.5 (3AG S/B-1.5A)	342001	MDL 1½A	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Electro-Voice PART No.	NOTES
M3	Pilot Light		#40, Screw base
M4	Switch		Selector - Rotary (wafer type)
M5	Switch		Record Compensation - Rotary (wafer type)

CHASSIS—TOP VIEW



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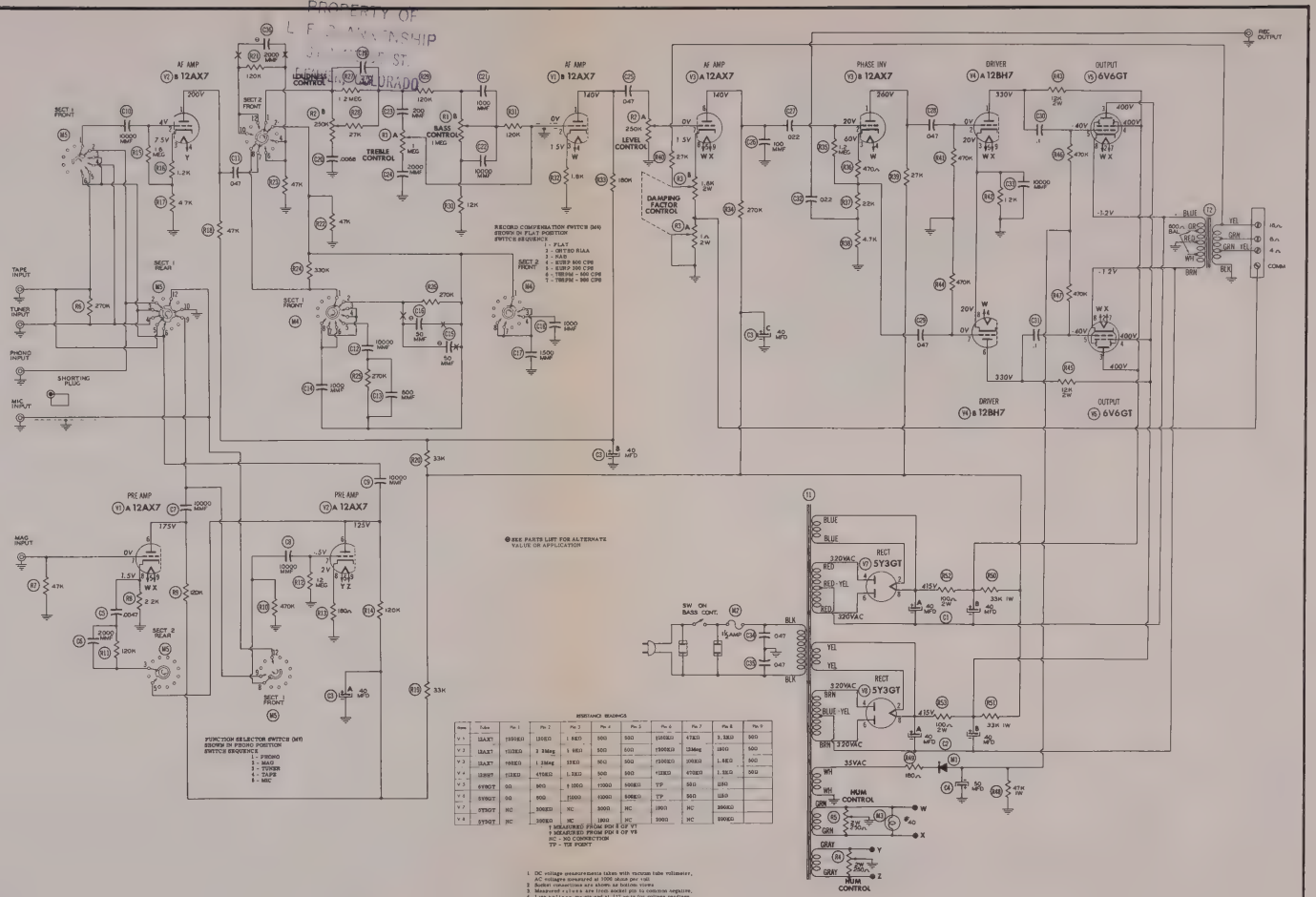

⊛ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	150KΩ	150Ω	1.5KΩ	500	500	150KΩ	47KΩ	3.5KΩ	500
V 2	12AX7	150KΩ	2.2Meg	1.5KΩ	500	500	150KΩ	12Meg	180Ω	500
V 3	12AX7	100KΩ	1.2Meg	33KΩ	500	500	150KΩ	100KΩ	1.5KΩ	500
V 4	12BH7	115KΩ	470KΩ	1.1KΩ	500	500	415KΩ	470KΩ	1.1KΩ	500
V5	6V6GT	0Ω	90Ω	0	100Ω	11000	500KΩ	TP	50Ω	0Ω
V 6	6V6GT	0Ω	90Ω	0	100Ω	11000	500KΩ	TP	50Ω	0Ω
V 7	5Y3GT	NC	500KΩ	NC	3000	NC	190Ω	NC	250KΩ	
V 8	5Y3GT	NC	500KΩ	NC	180Ω	NC	3000	NC	500KΩ	

1 MEASURED FROM PIN 8 OF V1
2 MEASURED FROM PIN 8 OF V2
NC - NO CONNECTION
TP - TOO POSITIVE

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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PHILCO MODELS
C-1334, C-1340, C-1341, C-1342, C-1343

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PHILCO MODELS
C-1334, C-1340, C-1341, C-1342, C-1343

PHILCO MODELS
C-1334, C-1340, C-1341, C-1342, C-1343

TRADE NAME	Philco Models C-1334, C-1340, C-1341, C-1342, C-1343
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated Phono Amplifier
TUBES (Three)	Types 12AV6 AF Amp., 50L6GT Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .18 Amp. @ 117 Volts AC
	Model C-1334 - 3 Speed Manual Record Changer Model C-1340 - 3 Speed Automatic Record Changer - Philco types M-24 or M-24A Models C-1341, 42, 43 - 3 Speed Automatic Record Changer - Philco type M-26

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PARTS LIST AND DESCRIPTIONS

PHILCO MODEL C-1334

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier	12AV6	12AV6	7BT	
V2	Audio Output	50L6GT	50L6GT	7S	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	80	150	30-2417-47			TC3116	TVL-8030-150	FMT-315	
B	20	150							
C2	10	25	30-2417-48						
C3	10000		30-1238-2	DD-103	811-01	DC-511	IMP4-S1	330411	
C4	.0022	400	30-4650-54	D6-222		PT6222	IMP6-D22	3306222	
C5	.047	400	30-4650-45	DF-503		PT4147	IMP4-S47	3304147	
C6	.01		30-4650-58						Note 1

Note 1. Not used in Model C-1334.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	33-5566-64	Q13-137	A47-1Meg-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	500KΩ	½	33-5565-80	Q13-133	A47-500K-Z	B-60	U-48	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	1Meg	½	66-5108340	BTS-1Meg	
R4	1Meg	½	66-5108340	BTS-1Meg	Note 3
R5	470KΩ	½	66-4478340	BTS-470K	Note 4
R6	10KΩ	½	66-3108340	BTS-10K	
R7	270KΩ	½	66-4278340	BTS-270K	Note 1
R8	470KΩ	½	66-4478340	BTS-470K	
R9	150Ω	½	66-1158340	BTS-150	
R10	4700Ω	½	66-2478340	BTS-4700	
R11	47Ω	1	66-0474340		
R12	880Ω		33-1343-3		Note 2

Note 1. Some versions may use a 220KΩ resistor in this application.
Note 2. Tube saver resistor, at normal room temperature resistance is 880Ω, when hot, resistance drops to 100Ω.
Note 3. Some versions use a 470KΩ resistor in this application.
Note 4. Not used in some versions.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.2KΩ	3.6Ω	32-8384-2	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	5"	PM	3.6Ω	36-1625-24 ① 36-1654-5 ② 36-1662 ③	5A1	① Used in Models C-1334 and C-1341 ② Speaker used in Model C-1340 ③ Speaker used in Models C-1342 and C-1343

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: PHILCO PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1	425-0012	ACD-2J	A-1 or A-3	46-T	0-1 or S-1 & 0-3	Manual Record Player
M1	45-9612 or 425-0011 or 425-0011			$2696		Record Changer M-24 Record Changers M-24A or M-26A

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: PHILCO PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2	325-0092 (78RPM Needle)	*A-85 or †A-75 or ♦A-75D &	*C-309 or †C-348 or ♦C-348D &	*W-5A or †W-5S or ♦W-5D &	Used in Manual Record Player
M3	325-0092-1 (33 1/3-45 Needle)	*A-85LP or †A-75LP or ♦A-75LPD	*A-319 or †A-347 or ♦A-347D	*W-5MGA or †W-5MGS or ♦W-5MGD	Used in Manual Record Player
M2	45-9588	*PH-12 or †PH-13 or †♦PH-13SD or ♦PH-13D	*AC-315 or *†AC-313 or *♦AC-313D3	*W-46TPA or †W-46TPA or ♦†W-46DS or ♦W-46TPD	Used in Models Employing Automatic Record Changer M-24
M2	45-9784 or 45-9787 or 45-9787-1	*PH-12 or †PH-13 or †♦PH-13SD or ♦PH-13D	*AC-431 or †AC-455 or ♦†AC-455D1 or †♦AC-455D2 or ♦AC-455D	*W-46TPA or †W-46TPS or ♦†W-46DS or ♦W-46TPD	Used in Models Employing Automatic Record Changers M-24A or M26

* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M4	Phono Motor	35-1516	
	Cabinet	11084	Model C-1334
	Cabinet	11090	Model C-1340
	Cabinet	11090-1	Model C-1341
	Cabinet	11089	Model C-1342
	Cabinet	11089-1	Model C-1343

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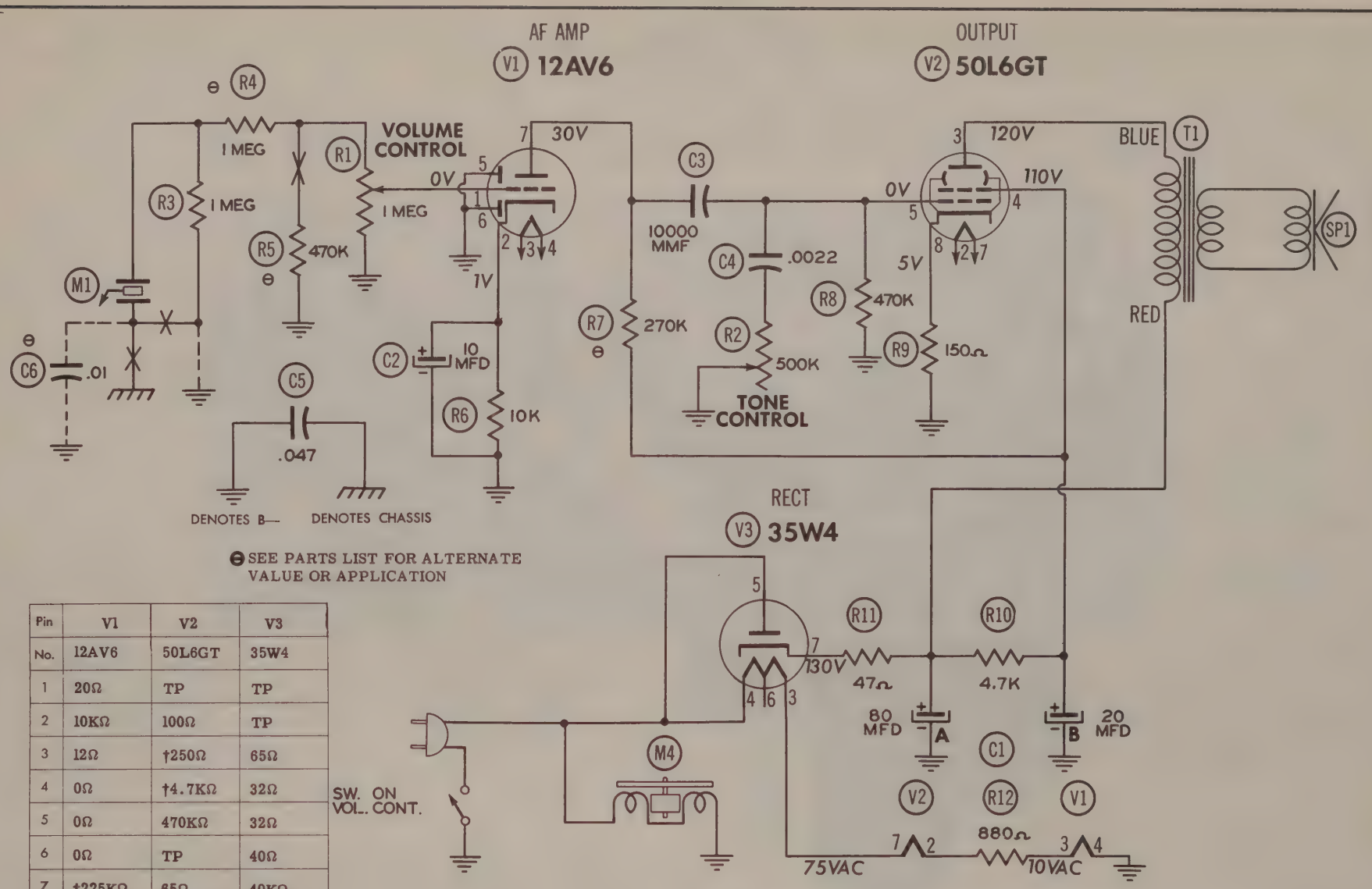
CHASSIS-BOTTOM VIEW

PHILCO
MODEL C-1334



SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

Pin No.	V1 12AV6	V2 50L6GT	V3 35W4
1	20Ω	TP	TP
2	10KΩ	100Ω	TP
3	12Ω	†250Ω	65Ω
4	0Ω	†4.7KΩ	32Ω
5	0Ω	470KΩ	32Ω
6	0Ω	TP	40Ω
7	†225KΩ	65Ω	40KΩ
8		150Ω	

† MEASURED FROM PIN 7 OF V3
TP - TIE POINT

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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RCA VICTOR MODELS 5-C-591, 5-C-592 (Ch. RC-1148)

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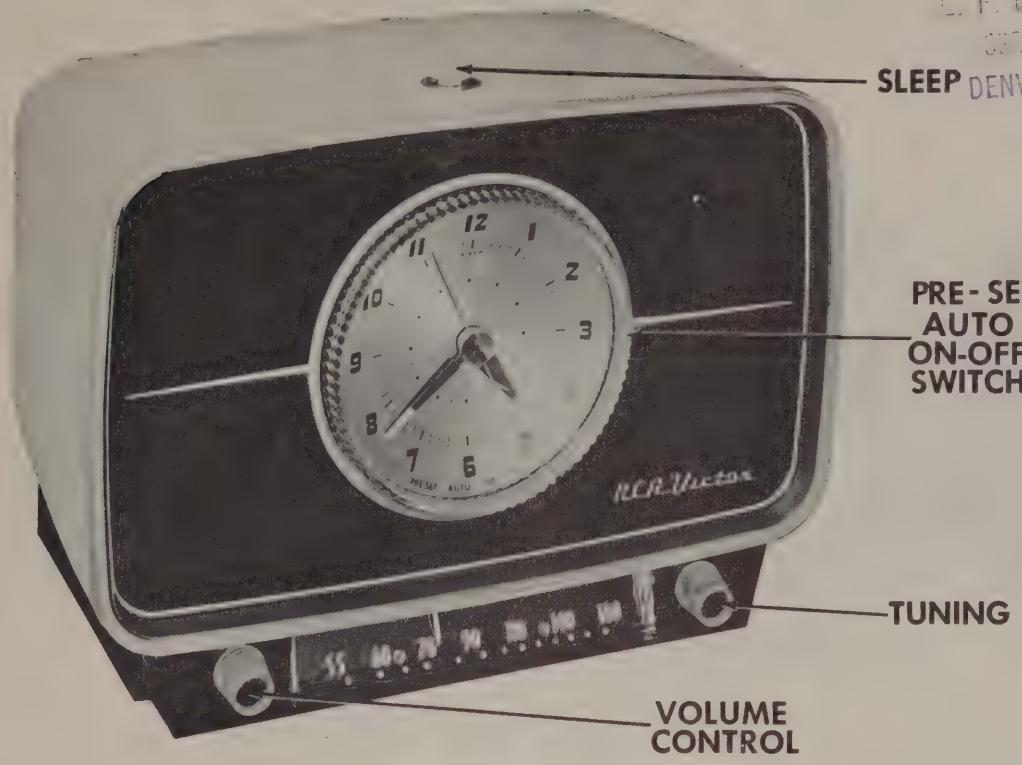

RCA VICTOR MODELS
5-C-591, 5-C-592 (Ch. RC-1148)

TRADE NAME	RCA Victor Models 5-C-591, 5-C-592 (Ch. RC-1148)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 2, N. J.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles — RATING .24 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
In steps 1 thru 5 "preset-manual" switch must be set in "manual" position (slide pushed up) during "manual" alignment.
In steps 6 and 7 "preset-manual" switch must be released so slide will be extended during preset alignment. Set preset volume control to extreme maximum clockwise position. (Located on rear apron of chassis.)

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 12BA6 (V2). Low side to B-.	455KC (400~ Mod)	Point of non-interference near 1600KC.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to antenna stator terminal lug. Low side to B-.	"	"	"	A3, A4	"
3.		Loop (Radiated)	1620KC	Tuning gang fully open.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	1400KC	"	A6	"
5.		"	600KC	600KC	"	A7	Adjust for maximum output while rocking tuning gang thru 600KC signal. Repeat steps 3, 4 and 5.
6.		"	1620KC	Tuning gang fully open.	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.		"	1400KC	1400KC	"	A9	"

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 5-C-591 (Ch. RC-1148)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	80	150	74662			TCD498	TDL-8050-150	FMT-1540	
B	50	150							
C2	.047	400	73553	DF-503		PT4147	IMP4-S47	3304147	
C3	56		75784	D6-560	831-560	UC-5456		K-1456	
C4	4.7		77471	TCZ-4R7	NP0A-4R7				
C5	.022	400	79932	DF-203	817-02	PT4122	IMP4-S22	3304122	
C6	.022	400	79932	DF-203	817-02	PT4122	IMP4-S22	3304122	
C7A	220								
B	5000								
C	5000		♦79058	♦PC-151	♦1408-02				
D	250								
E									
C8	.015	400	73797	DD16-153	821-015	PT6115	IMP6-S15	3306115	
C9	.047	400	75071	DF-503		PT4147	IMP4-S47	3304147	
C10	.1	400	73551	DF-104		PT401	IMP4-P1	330401	
C11	.1	400	73551	DF-104		PT401	IMP4-P1	330401	

♦ Items C7A, C7B, C7C, C7D, C7E, R8A, R8B and R8C are combined in one unit.
When replacing items separately, items C7D and C7E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	79945	Q13-137	A47-1Meg-Z	B-70	U-53	Manual Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	1Meg	½	79946	Q13-137	A47-1Meg-Z	AB-70	U-53	Preset Volume
B	Shaft		Not Req.	Not Req.	FS-3	AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R3	33KΩ	½	503333	BTS-33K	
R4	100Ω	½	503110	BTS-100	
R5	100Ω	½	503110	BTS-100	
R6	47KΩ	½	503347	BTS-47K	
R7	3.3Meg	½	503533	BTS-3.3Meg	

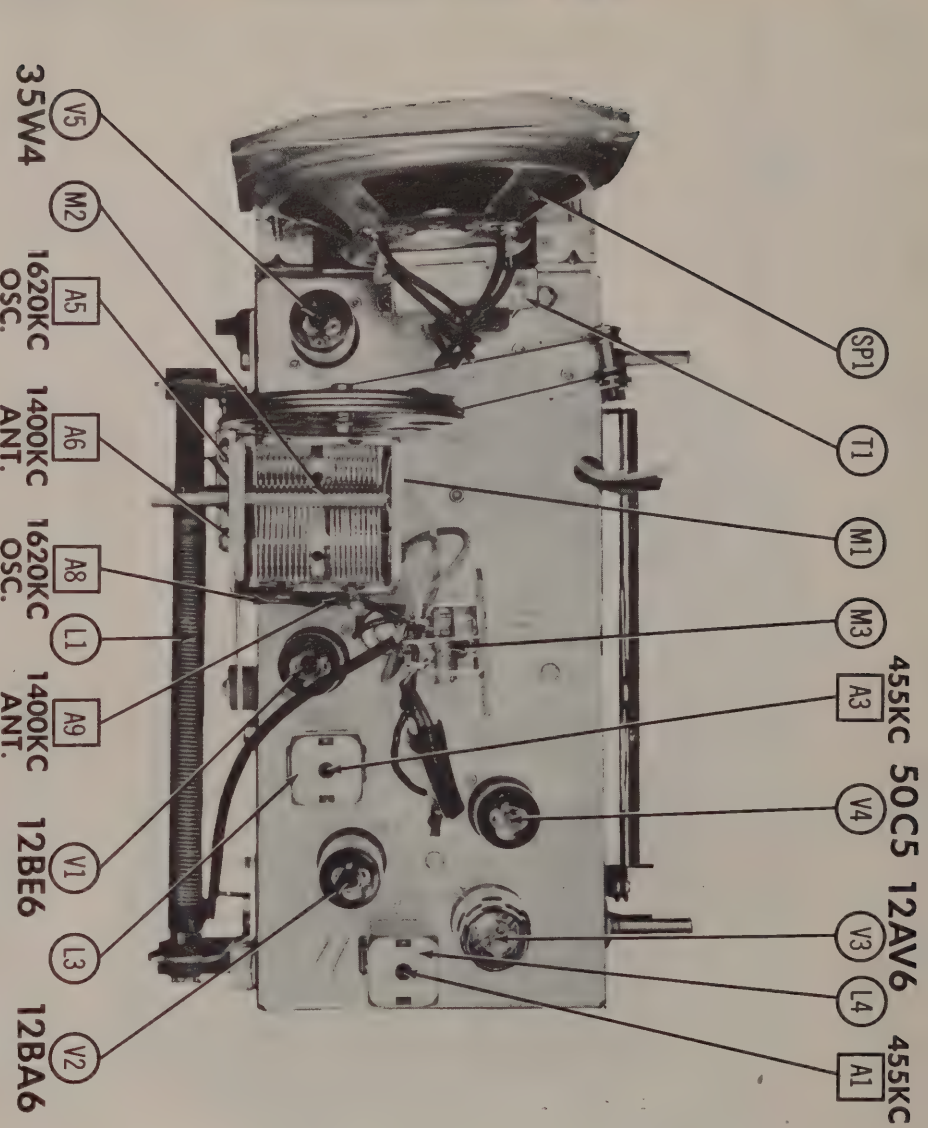
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R8A	6.8Meg	½	♦79058	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R9	150Ω	1	503115	BTS-150	
R10	1200Ω	1	512212	BTA-1200	
R11	33Ω	1	513033		

♦ Items R8A, R8B, R8C, C7A, C7B, C7C, C7D and C7E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.4KΩ	3.4Ω	79283	Z1102 ①	A-3031①	A-3336 ①	24S50A①	S-16X	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω	76402	4A07	

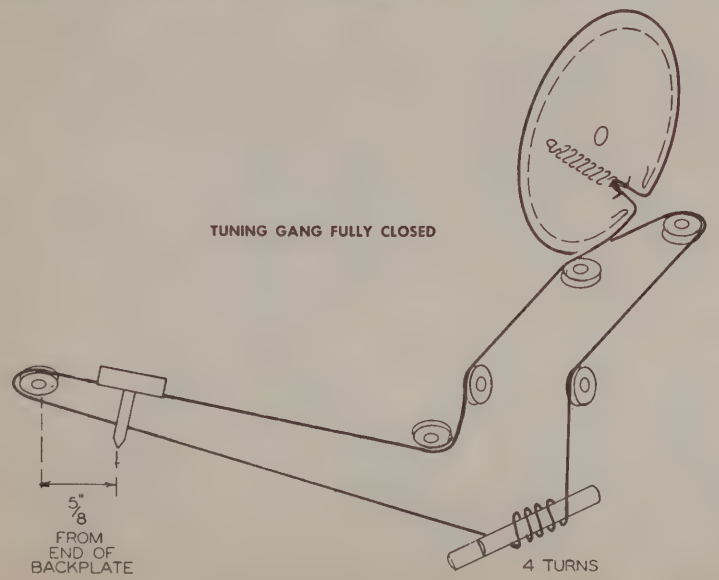
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.4Ω		79965				
L2	Osc. Coil	.6Ω	5.5Ω	79947	14-1074*	BC-394	71-Osc.	
L3	Input IF	16Ω	16Ω	75486	16-6758	BC-352	12-C1	
L4	Output IF	14Ω	14Ω	75487	16-6770	BC-355	12-C6	

* Leads sufficient mounting support.

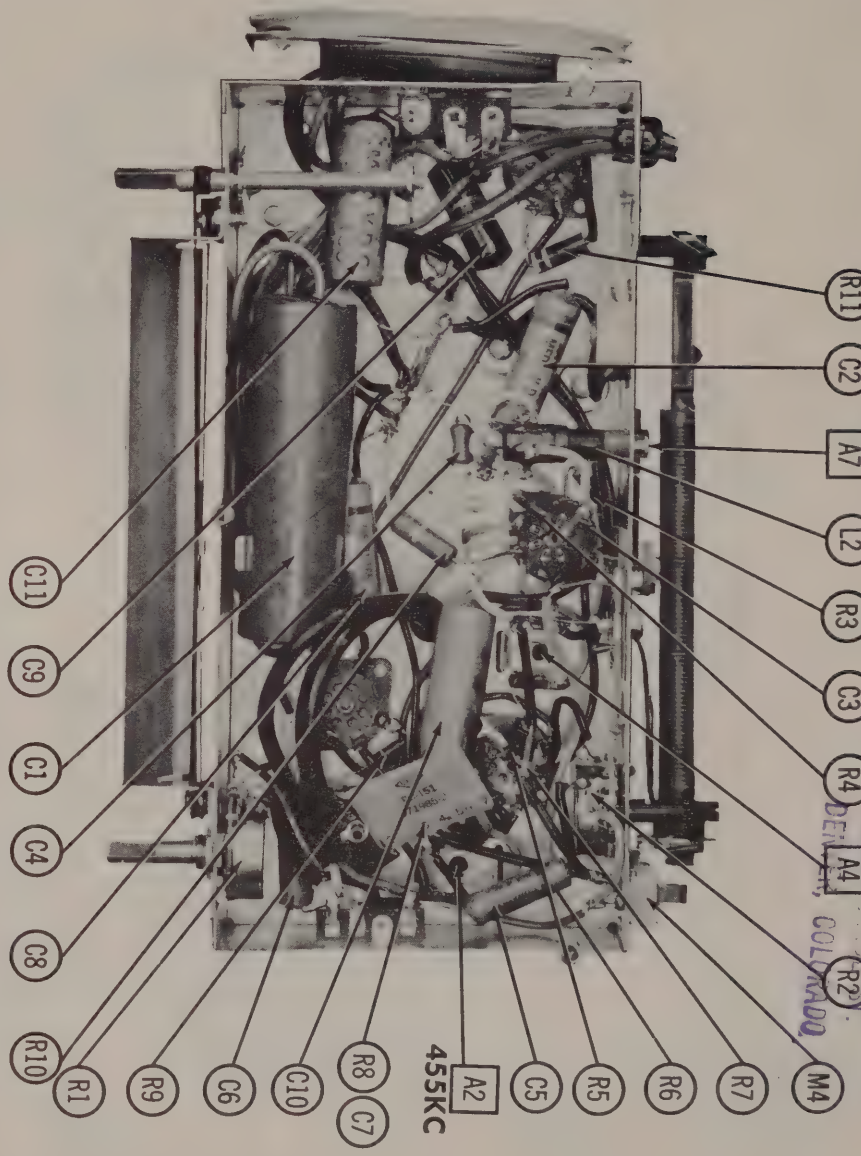
MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Tuning Cap.	79949	Manual (16-260MMF; 16-130MMF)
M2	Tuning Cap.	79950	Preset (16-260MMF; 16-130MMF)
M3	Switch	79951	Manual - Preset (Slide type)
M4	Switch	79256	Radio-Phono (SPDT - Slide type)
	Case	79933	Back Ass'y. (Hood) Model 5-C-591
	Case	79921	Back Ass'y. (Hood) Model 5-C-592
	Case	79955	Front Ass'y. (Cradle)
	Knob	79939	Sleep-Buzzer Control - Model 5-C-591
	Knob	79922	Sleep-Buzzer Control - Model 5-C-592
	Knob	79944	Preset Tuning - Model 5-C-591
	Knob	79923	Preset Tuning - Model 5-C-592
	Knob	79943	Tuning or Volume
	Knob	79934	Time Set



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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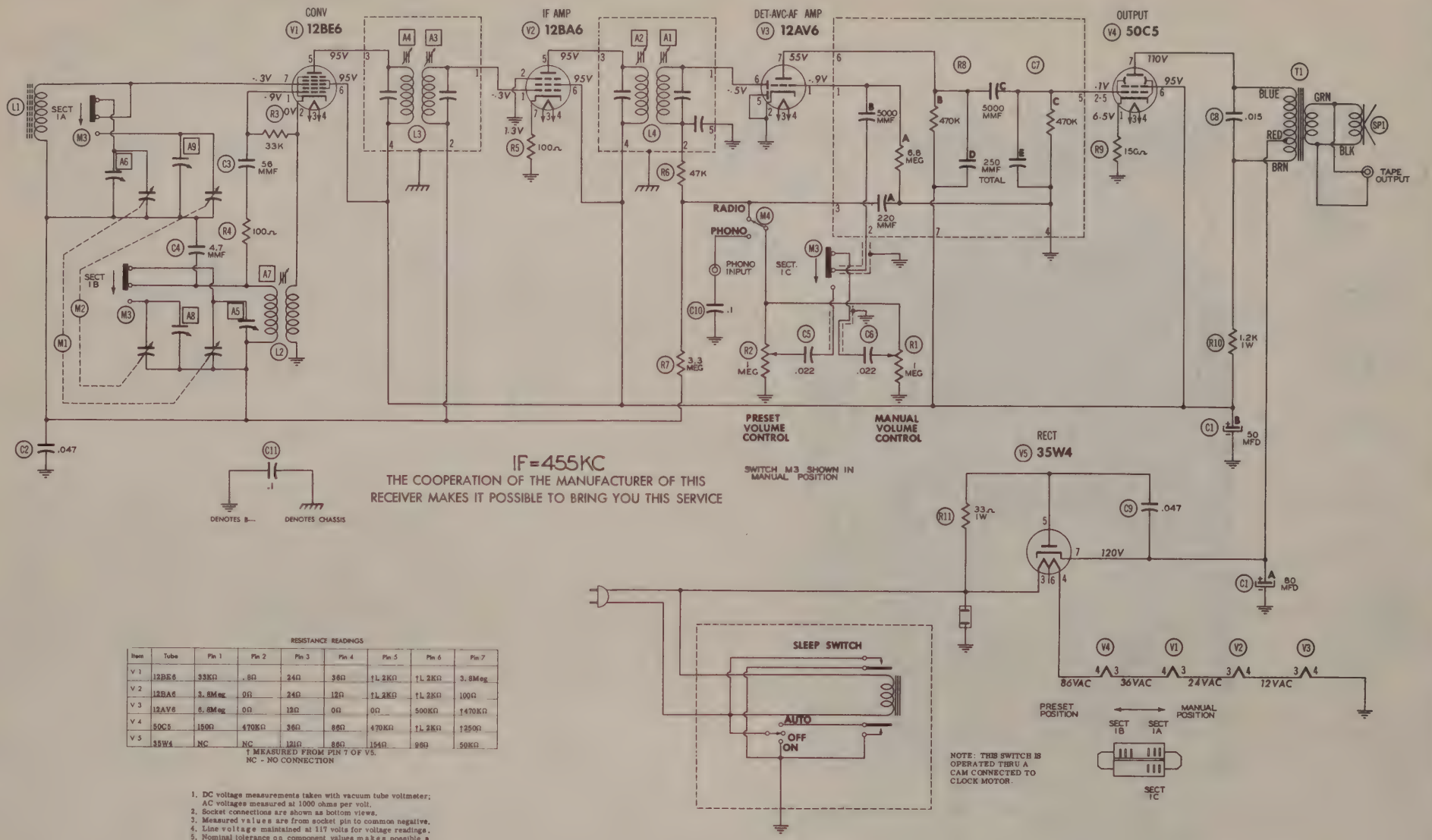
RCA VICTOR MODEL 5-C-591 (Ch. RC-1148)



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SWITCH M3 SHOWN IN MANUAL POSITION

NOTE: THIS SWITCH IS OPERATED THRU A CAM CONNECTED TO CLOCK MOTOR.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	33KΩ	.8Ω	24Ω	36Ω	↑L 2KΩ	↑L 2KΩ	3. 8Meg
V 2	12BA6	3. 8Meg	0Ω	24Ω	12Ω	↑L 2KΩ	↑L 2KΩ	100Ω
V 3	12AV6	6. 8Meg	0Ω	12Ω	0Ω	0Ω	500KΩ	↑470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	↑L 2KΩ	↑250Ω
V 5	35W4	NC	NC	12Ω	86Ω	154Ω	96Ω	50KΩ

↑ MEASURED FROM PIN 7 OF V5.
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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REGENCY
MODEL HF-200

TRADE NAME	Regency Model HF-200
MANUFACTURER	Regency Div., I.D.E.A. Inc., 7900 Pendletone Pike, Indianapolis, Ind.
TYPE SET	AC Operated 20 Watt Audio Amplifier
TUBES (Five)	Types 12AX7 AF Amp.-Phase Inv., 12AU7 Driver, (2) 6L6G Output, 5U4GA Output
POWER SUPPLY	110-120 Volts AC-50/60 Cycles RATING 1.06 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

REGENCY MODEL HF-200

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: REGENCY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier-Phase Inverter	12AX7	12AX7	9A	
V2	Driver	12AU7	12AU7	9A	
V3	Audio Output	6L6G	6L6G	7S	
V4	Audio Output	6L6G	6L6G	7S	
V5	Rectifier	5U4GA	5U4GA	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: REGENCY PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲20	500	30-011-9				TM-D20-500		
B	■20	450					TD-250-50		
C	▲250	50							
C2A	▲20	450	30-011-8			FP376.5	TM-T20-450	T-140	
B	■20	450							
C	▲20	450							
C3	.1	600		DF-104		PT601	IMP6-P1	330601	
C4	56	500		TCZ-56				KR-1456	Note 1
C5	.02	600		DF-203	817-02	PT612	IMP6-S2	330612	
C6	.1	600		DF-104		PT601	IMP6-P1	330601	
C7	.1	600		DF-104		PT601	IMP6-P1	330601	
C8	.03	600		DF-303		PT613	IMP6-S3	330613	
C9	.03	600		DF-303		PT613	IMP6-S3	330613	
C10	.05	600		DF-503		PT615	IMP6-S5	330615	
C11	.05	600		DF-503		PT615	IMP6-S5	330615	

Note 1. Serial numbers above 1500 use a 100MMF capacitor in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REGENCY PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	100-581-3	Q13-133	A47-500K-Z	B-60	U-48	Input level
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

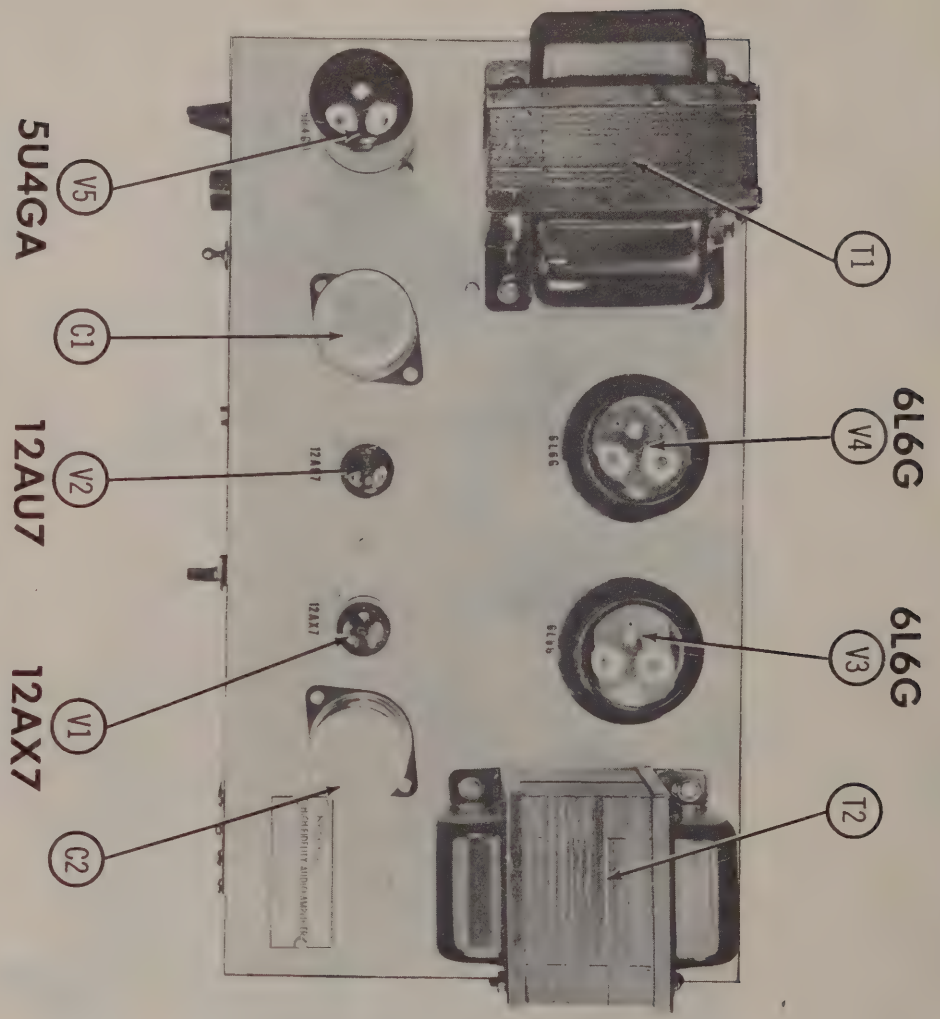
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: REGENCY PART No.	IRC PART No.	NOTES
R2	1200Ω	½		BTS-1200	Note 1
R3	33KΩ	½		BTS-33K	Note 2
R4	100KΩ	1		BTA-100K	
R5	22KΩ	½		BTS-22K	Note 3
R6	1Meg	½		BTS-1Meg	
R7	680Ω	½		BTS-680	
R8	47KΩ	½		BTS-47K	Note 4
R9	47KΩ	½		BTS-47K	Note 4
R10	18KΩ	1		BTA-18K	
R11	18KΩ	1		BTA-18K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: REGENCY PART No.	IRC PART No.	NOTES
R12	1Meg	½		BTS-1Meg	
R13	1000Ω	½		BTS-1000	
R14	47KΩ	1		BTA-47K	Note 4
R15	1Meg	½		BTS-1Meg	
R16	47KΩ	1		BTA-47K	Note 4
R17	4700Ω	2		BTB-4700	
R18	220KΩ	½		BTS-220K	
R19	220KΩ	½		BTS-220K	
R20	350Ω	10		1 3/4A-350	
R21	35KΩ	10			
R22	250Ω	20		2D-250	

Note 1. Some versions use a 56KΩ resistor in this application.
Note 2. Some versions use a 2200Ω resistor in this application.
Note 3. Chassis with serial number above 1500 use a 15KΩ, ½ watt resistor in this application.
Note 4. R8-R9 and R14-R16 are matched in pairs to a 1% tolerance.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @1.06A	760VCT .130ADC	5VAC @ 3A	6.3VCT @2.5A		H9316 ①		PC-8411①	22R33	R-18A ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6KΩ CT tap @ 140Ω CT RES	16Ω tap @ 8Ω,4Ω		H-4103 ②	A-3100 ① ②				① Tape 10KΩ primary taps ② Drill new mounting holes.

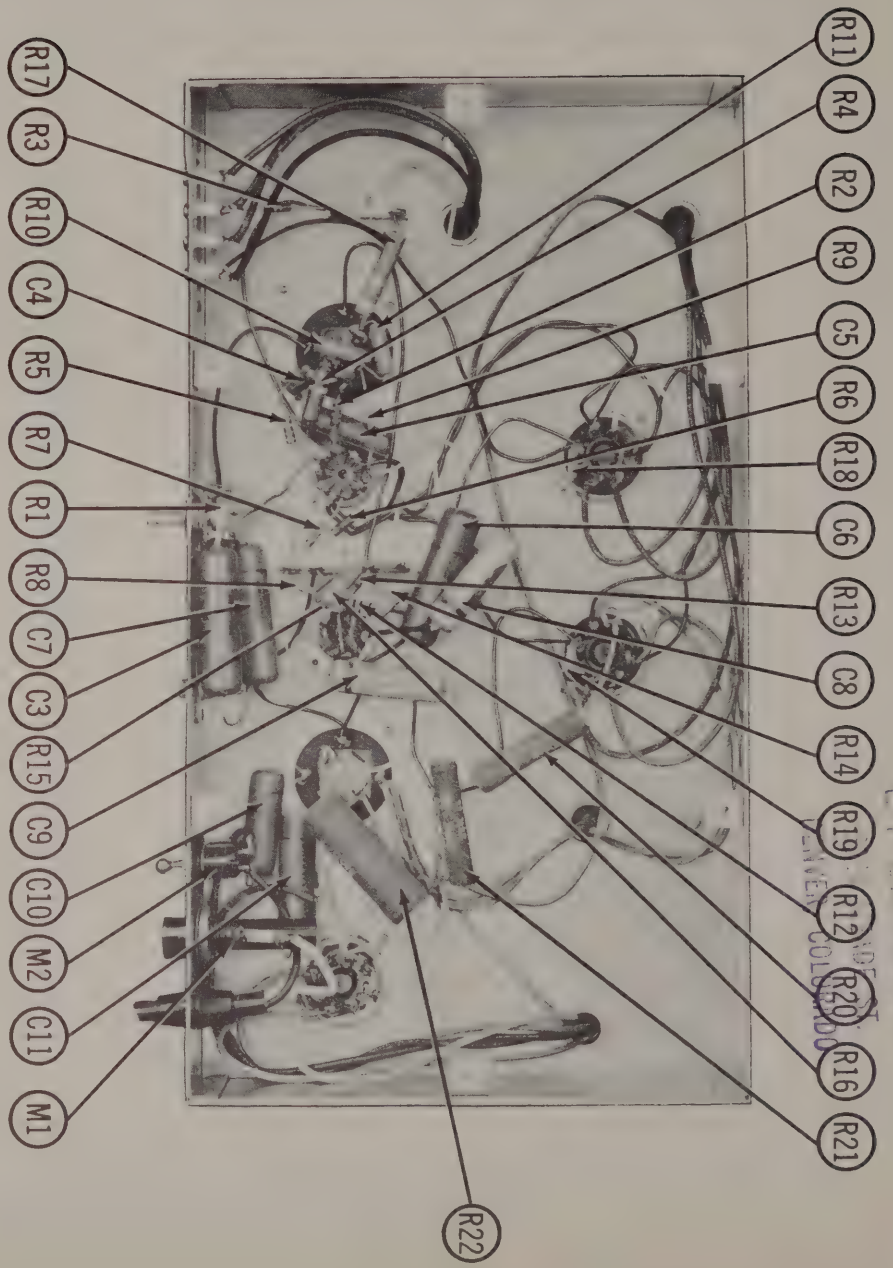
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			REGENCY PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A 250V			312002 (3AG-2A)	341001	AGC2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	REGENCY PART No.	NOTES
M2	Switch		On-off (power)

CHASSIS—BOTTOM VIEW



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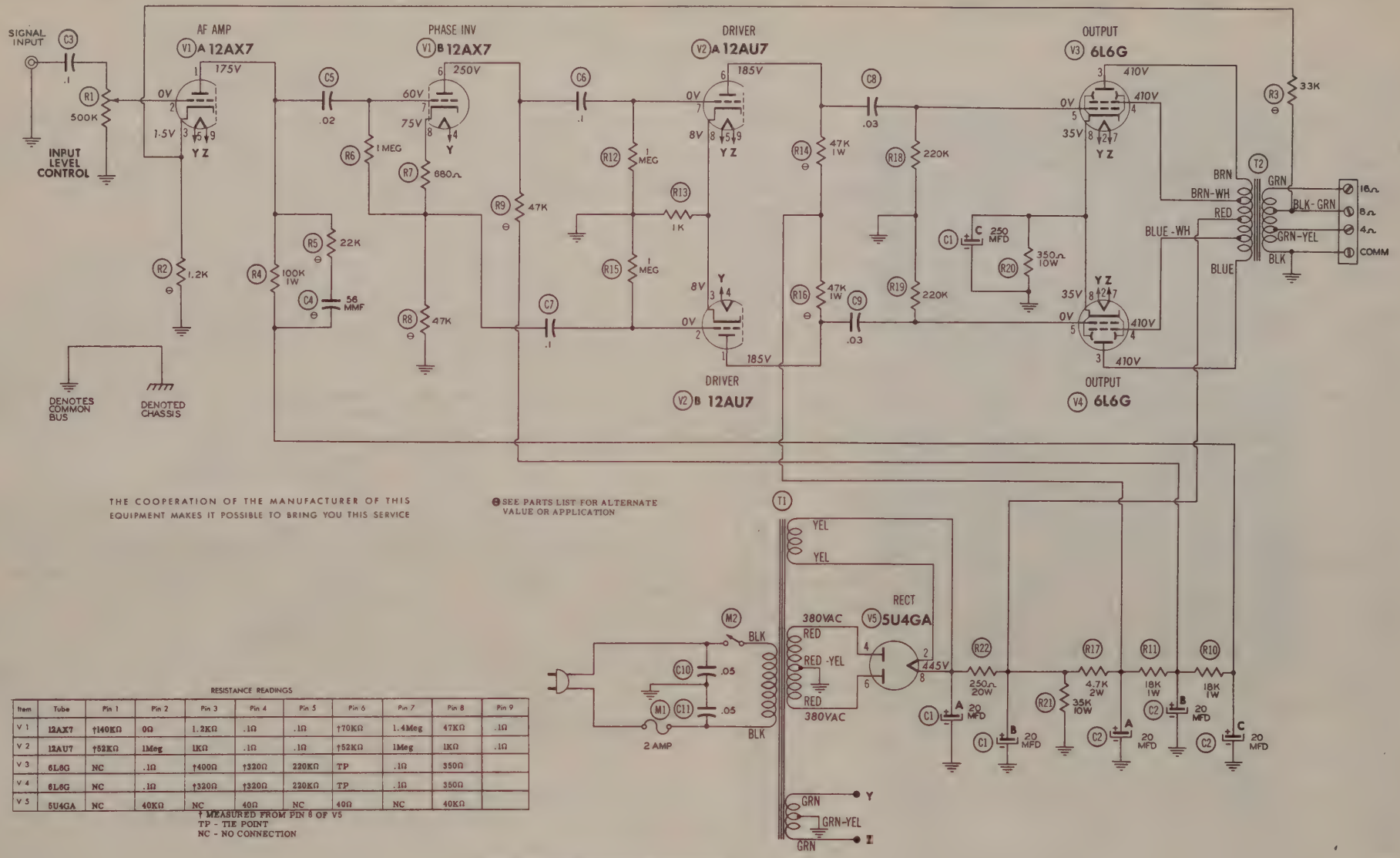

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†140KΩ	0Ω	1.2KΩ	.1Ω	.1Ω	†70KΩ	1.4Meg	47KΩ	.1Ω
V 2	12AU7	†52KΩ	1Meg	1KΩ	.1Ω	.1Ω	†52KΩ	1Meg	1KΩ	.1Ω
V 3	6L6G	NC	.1Ω	†400Ω	†320Ω	220KΩ	TP	.1Ω	350Ω	
V 4	6L6G	NC	.1Ω	†320Ω	†320Ω	220KΩ	TP	.1Ω	350Ω	
V 5	5U4GA	NC	40KΩ	NC	40Ω	NC	40Ω	NC	40KΩ	

† MEASURED FROM PIN 8 OF V5
TP - TIE POINT
NC - NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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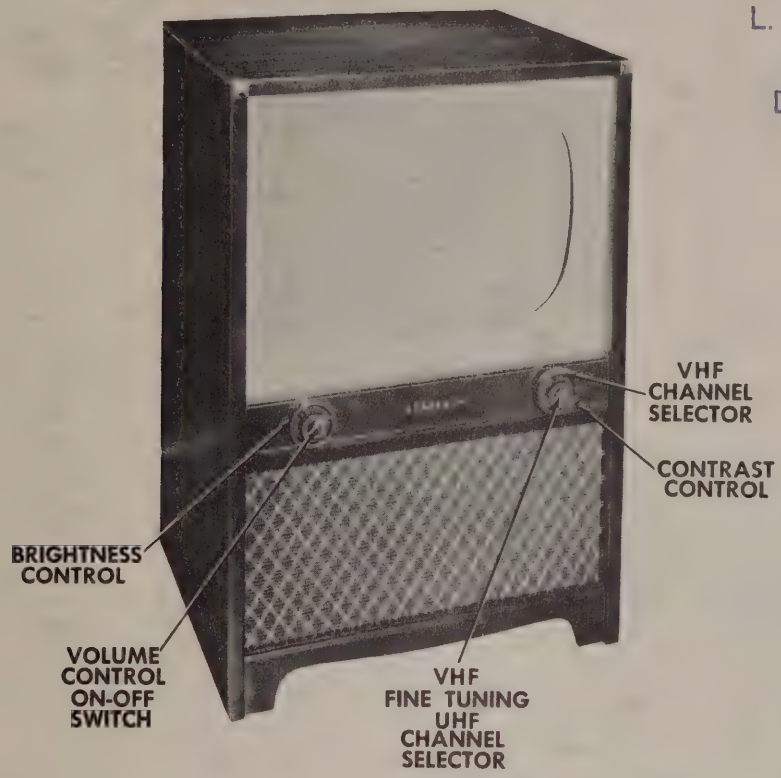

SYLVANIA MODEL 521 (Ch. 1-521-2)

TRADE NAME	Sylvania	MODELS	CHASSIS
		510, 513, 520, 521, 526, 571, 573, 575, 576, 577, 613, 620, 621, 670, 675 Series	1-521-1, -2, -3, -6, -7, -8
MANUFACTUER	Sylvania Electric Prod., Inc., Radio & Television Div., 254 Rano St., Buffalo, N. Y.		
TYPE SET	Television Receiver		
TUBES	Twenty-two		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 1.42 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

INDEX

Alignment Instructions ..... 5 thru 8
Drive Cord Stringing (UHF) 20
Disassembly Instructions 26
Horizontal Sweep Circuit Adjustments 13
Parts List and Descriptions ..... 21 thru 24
Photographs
- Cabinet-Rear View 13
- Capacitor Identification 4, 9
- Chassis-Top View 3
- RF Tuner 16, 17, 25
- Resistor Identification 14, 15

Photographs (Con't)
- Trans., Inductor & Alignment Identification 18

Production Changes 19
Resistance Measurements 11
Servicing in the Field 26
Schematic (Alternate Tuners) 20, 27
Schematic (TV) 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 10
Tube Placement Chart (Bottom View) 11
Tube Placement Chart (Top View) 10

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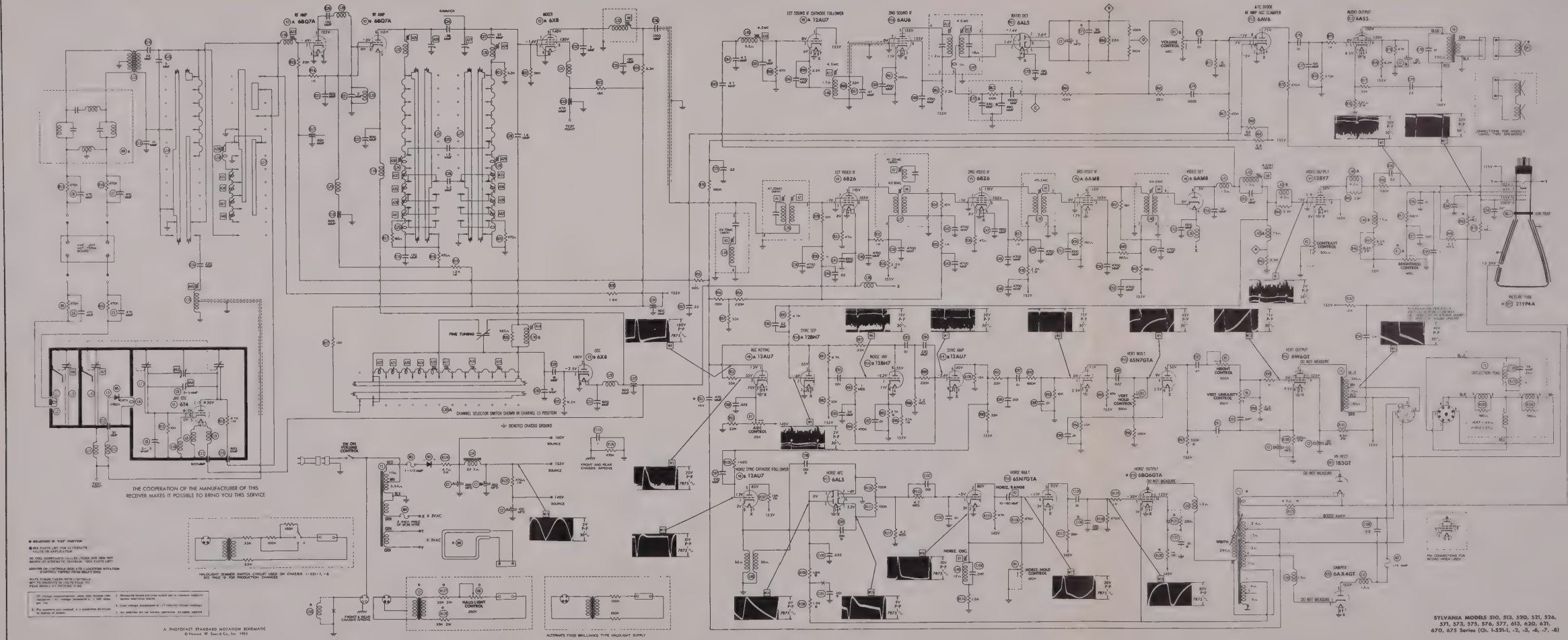
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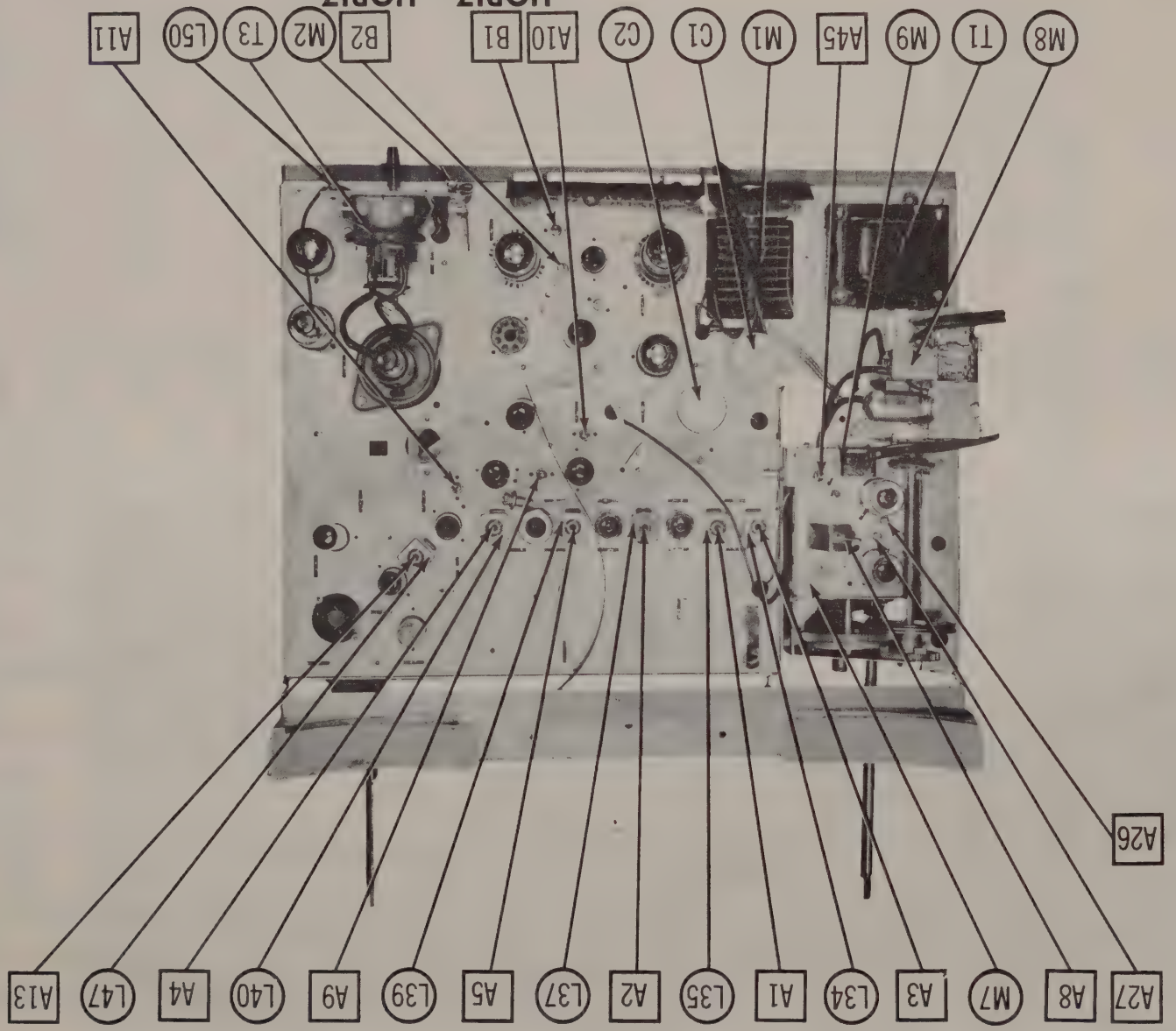
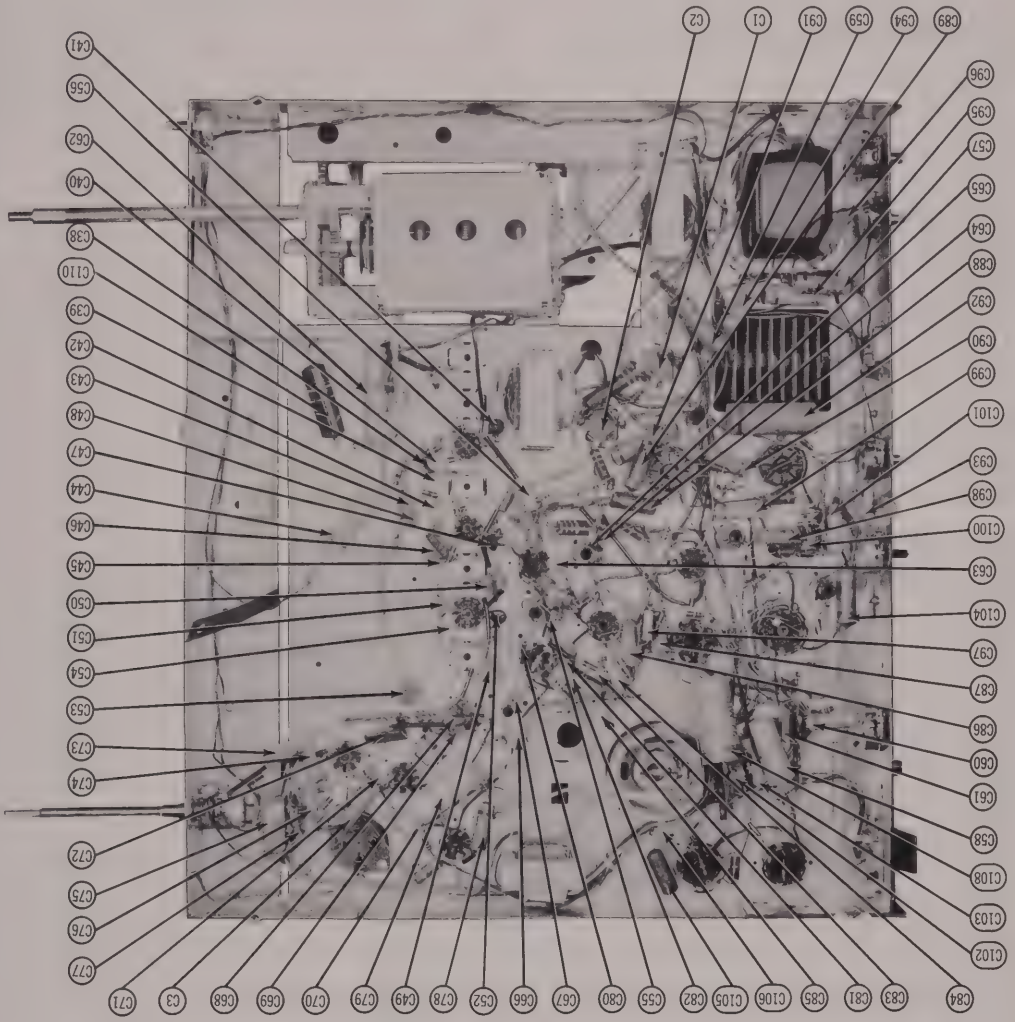
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
Receiver chassis is connected to one side of the 117 volt AC line.
Make all ground connections to insulated center portion of the chassis.
Where there are two coils on one coil form, adjust with maximum separation between the two cores. Both top and bottom adjustments may be made from underside of the chassis using hex alignment tool.
Be sure VHF tuner shield is in place. Allow about 15 minutes for receiver and test equipment to warm up.

VIDEO IF ALIGNMENT

Connect negative lead of a 4 volt bias supply to the ungrounded side of C43. Connect positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V3). Low side to chassis.	Not used.	47.25MC (unmod)	Any unused high band channel.	Use VTVM DC probe to point (A). Common to chassis.	A1	Attenuate generator output to maintain 1 to 2 volts on VTVM. Adjust for MINIMUM deflection.
2.	"	"	"	41.25MC	"	"	A2	"
3.	"	"	"	39.75MC	"	"	A3	"
4.	"	"	"	44.0MC	"	"	A4	Attenuate generator output to maintain 1 to 2 volts on VTVM. Adjust for maximum deflection.
5.	"	"	"	45.3MC	"	"	A5	"
6.	"	"	"	42.6MC	"	"	A6	"
7.	"	"	43.5MC (10MC Swp)	42.4MC 45.75MC	"	Vert. amp. thru 33KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, SLIGHTLY retouch A4, A5 and A6 to obtain desired response.
8.	"	"	"	39.75MC 42.6MC 45.75MC 47.25MC	"	"	A7, A8	Adjust A7 and A8 for response curve similar to Fig. 2. Do not retouch A4, A5 and A6 for correct tilt. Repeat steps 1, 2 and 3. If traps require readjustment, recheck response curve as in Fig. 2. If necessary, retouch A7 and A8 again. Remove bias supply and all test equipment. Replace loose tube shield over V3.

4.5MC TRAP ALIGNMENT

Set contrast control for maximum. Short pin 1 (grid) of 6BZ6 (V5) to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	47KΩ	High side thru 47KΩ to pin 7 (cathode) of 6AM8 (V6). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to pin 11 (cathode) of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection on VTVM. Remove short from V5.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Short pin 1 (grid) of 6BZ6 (V5) to chassis.
Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	47KΩ	High side thru 47KΩ to pin 7 (cathode) of 6AM8 (V6). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (C). Common to point (D).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Remove short from V5.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.
Short pin 1 of V5 to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	47KΩ	High side thru 47KΩ to pin 7 (cathode) of 6AM8 (V6). Low side to chassis	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A10, A11, A12	Disconnect stabilizing capacitor (C3). Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
11.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A13	Reconnect stabilizing capacitor (C3). Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines. Remove short from pin 1 of V5.

ALTERNATE SOUND IF ALIGNMENT

If a 4.5MC signal of crystal accuracy is not available, the sound IF strip may be aligned by tuning in a strong TV station. Connect the VTVM and adjust A10, A11, A12 and A13 as outlined under steps 10 and 11 under "Sound IF Alignment Using AM Signal Generator and VTVM".

SYLVANIA MODELS 510, 513, 520, 521, 526, 571, 573, 575, 576, 577, 613, 620, 621, 670, 675 Series (Ch. 1-521-1, -2, -3, -6, -7, -8)

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ALIGNMENT INSTRUCTIONS (cont)

VHF TUNER OSCILLATOR ALIGNMENT

Remove (6BZ6) V5 from its socket. Use only enough sweep generator output to provide usable pattern on scope. Connect the negative lead of a 2.5 volt bias supply to the tuner AGC point. Connect positive lead to chassis. During alignment, the use of two marker generators is required. Generator #1 (IF) is connected through 2 or 3MMF capacitor to one side of the antenna terminals, coupled loosely. If the sweep generator has a built in marker generator, it should be used as marker generator #2 (RF). If not, connect a separate marker (RF) to the other side of antenna terminal, coupled loosely thru a 2 or 3 MMF capacitor.
All connecting leads should be shielded and kept short as possible.
Set the fine tuning control so the plates are approximately half meshed. Disconnect the primary winding of L37 from pin 5 (plate) of 6BZ6 (V4) and connect a 330Ω resistor from pin 5 to the B+ end of L37.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Channels 12, 10, 8, 5, 3 and 2 are aligned by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC (RF marker) 45.75MC (IF marker)	13	Vert. amp. thru detector (Fig. 5) to pin 5 (plate) of 6BZ6 (V4). Low side to chassis.	A14	Adjust so that RF and IF markers coincide as in Fig. 6. Curves may not be symmetrical until RF alignment is complete.
13.	"	"	201MC (10MC Swp)	199.25MC 45.75MC	11	"	A15	Adjust so that RF and IF markers coincide as in Fig. 6.
14.	"	"	189MC (10MC Swp)	187.25MC 45.75MC	9	"	A16	"
15.	"	"	177MC (10MC Swp)	175.25MC 45.75MC	7	"	A17	"
16.	"	"	85MC (10MC Swp)	83.25MC 45.75MC	6	"	A18	"
17.	"	"	79MC (10MC Swp)	77.25MC 45.75MC	5	"	A19	If RF and IF markers do not coincide as in Fig. 6, adjust A19 by expanding or compressing coil turns.
18.	"	"	69MC (10MC Swp)	67.25MC 45.75MC	4	"	A20	Adjust so that RF and IF markers coincide as in Fig. 6.
19.	"	"	63MC (10MC Swp)	61.25MC 45.75MC	3	"	A21	If RF and IF markers do not coincide as in Fig. 6, adjust A21 by expanding or compressing coil turns.
20.	"	"	57MC (10MC Swp)	55.25MC 45.75MC	2	"	A22	If RF and IF markers do not coincide as in Fig. 6, adjust A22 by expanding or compressing coil turns.

VHF TUNER RF ALIGNMENT

Care must be exercised not to disturb the proceeding aligned coil increments. Disconnect R22 from chassis and connect a 1KΩ from loose end of R22 to chassis. Connect bias as in "Oscillator Alignment". All connecting leads should be short as possible and shielded.
Use only enough sweep generator output to produce usable indication on scope.
Remove V5 from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Leave 330Ω between pin 5 of V5 and B+ point on L36 as in "Oscillator Alignment".

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
21.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	42.1MC 45.75MC	13	Vert. amp. thru detector (Fig. 5) to pin 5 (plate) of V4. Low side to chassis.	A7, A8	Check for response curve similar to Fig. 7. If necessary, SLIGHTLY retouch A7 and A8 for desired response.
22.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru detector (Fig. 5) to junction of R22 and 1KΩ (added) resistor. Low side to chassis.	A23, A24, A25	Adjust A23 for maximum mid-band height. Adjust A24 for flat-topped response. Adjust A25 for proper skirt contour and position of marker. See Fig. 9. Picture carrier should be 100%. Sound carrier may be as low as 70%.
23.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A26, A27	Adjust for symmetrical response as in Fig. 9.
24.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check each channel for response similar to Fig. 9. If not within limits, repeat steps 22 and 23. If necessary, make compromise adjustments of A23, A24, A25, A26 and A27 for best acceptable response.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
25.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A28, A29, A30	Adjust A28 for maximum mid-band height. Adjust A29 for flat-topped response. Adjust A30 for proper skirt contour and position of markers. See Fig. 9.
26.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A31, A32, A33	Compress or expand coils for curve similar to Fig. 9. Picture and sound markers should remain on top of curve.
27.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A34, A35, A36	"
28.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A37, A38, A39	"
29.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A40, A41, A42	"
30.	Recheck all channels for flat topped response. If necessary, retouch A23 thru A42 in order given. A dip of 30% is permissable on all channels. Remove 330Ω resistor from plate of V4 to B+. Restore connection to L37. Replace V5 in its socket. Remove test equipment. Remove 1KΩ resistor from tuner and reconnect R22 to chassis.							

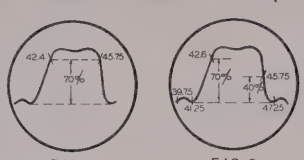

FIG. 1

FIG. 2

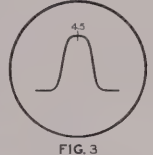

FIG. 3

FIG. 4

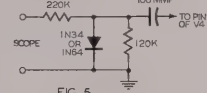

FIG. 5

FIG. 6

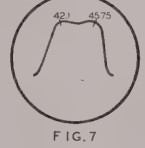

FIG. 7

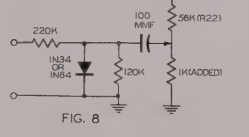

FIG. 8

UHF TUNER ALIGNMENT

Switch tuner to "UHF" position.

UHF OSCILLATOR ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
31.	See Fig. 10	Thru matching pad (Fig. 10).	900MC (Unmod)	83 (UHF) Tuning cap fully open	DC probe to point (A) Common to chassis.	A43	Adjust for maximum deflection.
32.	"	"	460MC	14 (UHF) Tuning cap fully closed	"	A44	Adjust for maximum deflection. Recheck step 31.

UHF OUTPUT CIRCUIT ALIGNMENT

Connect bias as under "Video IF Alignment". Remove UHF tuner section from chassis and remove crystal (1N82A). Solder a 270Ω resistor to mixer loop side of crystal holder. Remount tuner to bracket and reconnect ground strap.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
33.	270Ω Resistor	High side to loose end of 270Ω resistor. Other end of 270Ω to miner loop of crystal holder. Low side to chassis.	43.5MC (10MC Swp)	43.8MC 46.75MC	UHF (Tuning cap meshed)	Vert. Amp. thru 33KΩ to point (A) Low side to chassis.	A45	If separate marker generator is used couple loosely to crystal holder side of 270Ω resistor. Adjust A45 for response similar to Fig. 2. Remove sweep generator and 270Ω resistor from crystal holder. Remount UHF tuner so end of capacitor plates are up. Replace 1N82A crystal.

UHF PRE-SELECTOR ALIGNMENT

Leave bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
34.	See Fig. 10	Thru matching pad (Fig. 10)	473MC thru 887MC (10MC Swp)	42.1MC 46.75MC	UHF (14 thru 83)	Vert. Amp. thru 33KΩ to point (A) Low side to chassis	A46, A47	Couple separate marker generator loosely to pin 2 of 6BZ6 (V4). Turn tuner and sweep generator simultaneously thru the entire UHF tuning range and observe response curve which should be similar to Fig. 2. Adjust A46 and A47 for best compromise of tilt and dip. If necessary, further adjust by SLIGHTLY bending rotor plates. Make adjustment at point where rotor is just meshing with stator. Disconnect test equipment. Remount UHF tuner to normal position.

VHF RF ALIGNMENT FOR TUNER PART #321-0055 USED IN CHASSIS 1-521-3

Connect the negative lead of a 1.5 volt bias supply to the tuner AGC terminal. Connect the positive lead to chassis.
Use only enough sweep generator output to produce usable pattern on scope.
Remove the second video IF amplifier tube (V5) from its socket.
All connecting leads should be as short as possible and shielded.
If a second RF marker generator is used, couple it loosely to one side of the antenna terminals. Connect low side to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
35.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (A) Low side to chassis.	A48, A49 A50	Adjust for symmetrical response curve. See Fig. 9 for acceptable response curve. Picture and sound markers should be on top of the response curve.
36.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check each channel for response similar to Fig. 9. If markers fall below 70% on any channel, make compromise adjustment of A48, A49 and A50 with channel switch set to that channel, then recheck all other channels to see that they have not been seriously affected. Replace V5 in its socket. Remove bias and test equipment.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

SYLVANIA MODELS 510, 513, 520, 521, 526, 571, 573, 575, 576, 577, 613, 620, 621, 670, 675 Series (Ch. 1-521-1, -2, -3, -6, -7, -8)

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RUCTIONS (cont)

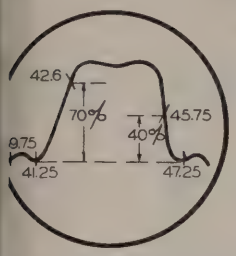


FIG. 2

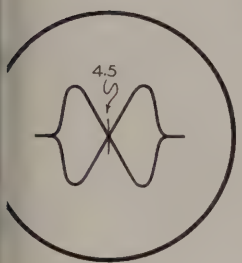
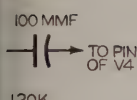
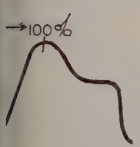
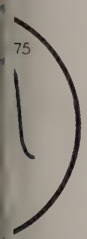
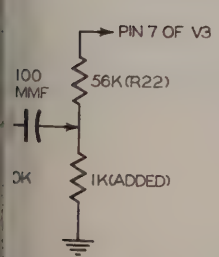


FIG. 4









UHF TUNER ALIGNMENT

Switch tuner to "UHF" position.

UHF OSCILLATOR ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
31	See Fig. 10	Thru matching pad (Fig. 10).	900MC (Unmod)	83 (UHF) Tuning cap fully open	DC probe to point (A). Common to chassis.	A43	Adjust for maximum deflection.
32	"	"	460MC	14 (UHF) Tuning cap fully closed	"	A44	Adjust for maximum deflection. Recheck step 31.

UHF OUTPUT CIRCUIT ALIGNMENT

Connect bias as under "Video IF Alignment". Remove UHF tuner section from chassis and remove crystal (1N82A). Solder a 270Ω resistor to mixer loop side of crystal holder. Remount tuner to bracket and reconnect ground strap.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
33	270Ω Resistor	High side to loose end of 270Ω resistor. Other end of 270Ω to mixer loop of crystal holder. Low side to chassis.	43.5MC (10MC Swp)	42.6MC 45.75MC	UHF (Tuning cap fully meshed)	Vert. Amp. thru 33KΩ to point (A). Low side to chassis.	A45	If separate marker generator is used couple loosely to crystal holder side of 270Ω resistor. Adjust A45 for response similar to Fig. 2. Remove sweep generator and 270Ω resistor from crystal holder. Remount UHF tuner so end of capacitor plates are up. Replace 1N82A crystal.

UHF PRE-SELECTOR ALIGNMENT

Leave bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
34	See Fig. 10	Thru matching pad (Fig. 10)	473MC thru 887MC (10MC Swp)	42.1MC 45.75MC	UHF (14 thru 83)	Vert. Amp. thru 33KΩ to point (A). Low side to chassis.	A46, A47	Couple separate marker generator loosely to pin 2 of 6BZ6 (V4). Turn tuner and sweep generator simultaneously thru the entire UHF tuning range and observe response curve which should be similar to Fig. 2. Adjust A46 and A47 for best compromise of tilt and dip. If necessary, further adjust by SLIGHTLY bending rotor plates. Make adjustment at point where rotor is just meshing with stator. Disconnect test equipment. Remount UHF tuner to normal position.

VHF RF ALIGNMENT FOR TUNER PART #323-0055 USED IN CHASSIS 1-521-3

Connect the negative lead of a 1.5 volt bias supply to the tuner AGC terminal. Connect the positive lead to chassis.
Use only enough sweep generator output to produce usable pattern on scope.
Remove the second video IF amplifier tube (V5) from its socket.
All connecting leads should be as short as possible and shielded.
If a second RF marker generator is used, couple it loosely to one side of the antenna terminals. Connect low side to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
35	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A48, A49 A50	Adjust for symmetrical response curve. See Fig. 9 for acceptable response curve. Picture and sound markers should be on top of the response curve.
36	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check each channel for response similar to Fig. 9. If markers fall below 70% on any channel, make compromise adjustment of A48, A49 and A50 with channel switch set to that channel, then recheck all other channels to see that they have not been seriously affected. Replace V5 in its socket. Remove bias and test equipment.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNER PART #323-0055 USED IN CHASSIS 1-521-3

Connect bias as under "RF Alignment For VHF Tuner #323-0055".
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A51. It should be noted that this is an all channel oscillator adjustment and should not be used to correct any individual channel. If adjustment of A51 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency.
The channel oscillator adjustment screws are reached through a hole just above and to the left of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Remove V5 from its socket.
During the oscillator alignment, the use of two marker generators is required. Generator #1 (IF) is coupled loosely to one side of the antenna terminals. If the sweep generator has a built in marker, it should be used as the "RF" marker. If not, connect a second marker generator (RF) to the other side of antenna terminals, coupled loosely. Use low marker generator output.
Use only enough sweep generator output to provide usable pattern on scope.
Disconnect primary of L37 from pin 5 (plate) of first IF tube (V4) and connect a 330Ω resistor from B+ end of L37 to pin 5 of V4.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
37.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC (RF marker) 45.75MC (IF marker)	13	Vert. Amp. thru detector (Fig. 5) to pin 5 (Plate) of first video IF tube. Low side to chassis.	A52	Adjust so that RF and IF markers coincide as in Fig. 6. Remove 330Ω from plate of L37 to B+. Restore connection to L37. Replace V5 in its socket. Remove bias and all test equipment.
			207MC (10MC Swp)	205.25MC 45.75MC	12		A53	
			201MC (10MC Swp)	199.25MC 45.75MC	11		A54	
			195MC (10MC Swp)	193.25MC 45.75MC	10		A55	
			189MC (10MC Swp)	187.25MC 45.75MC	9		A56	
			183MC (10MC Swp)	181.25MC 45.75MC	8		A57	
			177MC (10MC Swp)	175.25MC 45.75MC	7		A58	
			85MC (10MC Swp)	83.25MC 45.75MC	6		A59	
			79MC (10MC Swp)	77.25MC 45.75MC	5		A60	
			69MC (10MC Swp)	67.25MC 45.75MC	4		A61	
			63MC (10MC Swp)	61.25MC 45.75MC	3		A62	
			57MC (10MC Swp)	55.25MC 45.75MC	2		A63	

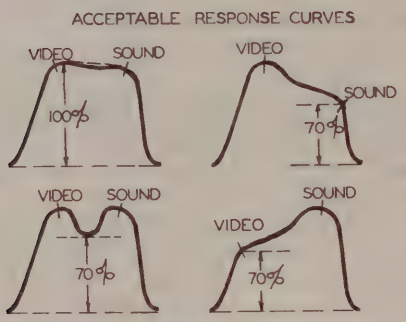


FIG. 9

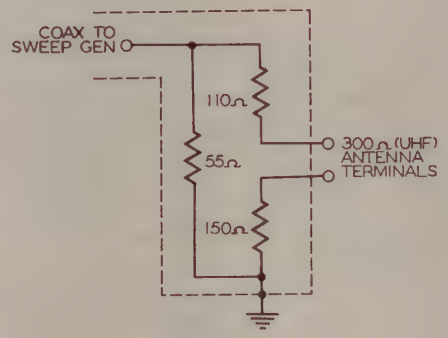
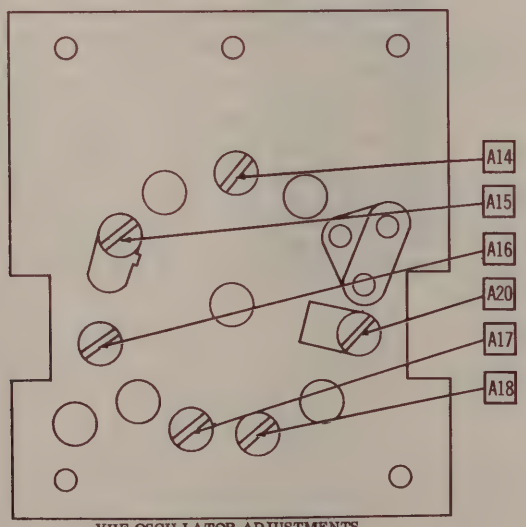


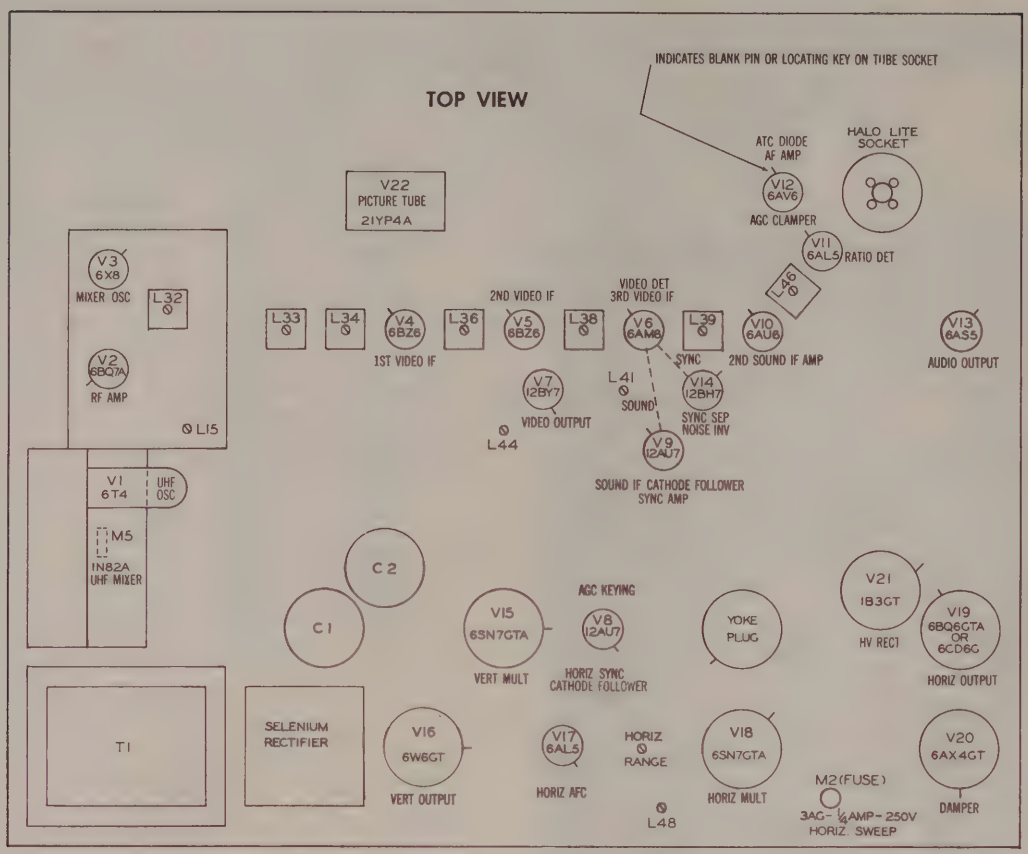
FIG. 10



VHF OSCILLATOR ADJUSTMENTS

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifier (M1), Fuses (M3 & M4)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6 (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V7, V8, V22**
Has pic, no sound - **V9, V10, V11, V12, V13**
Overloaded picture - **V8, V12**

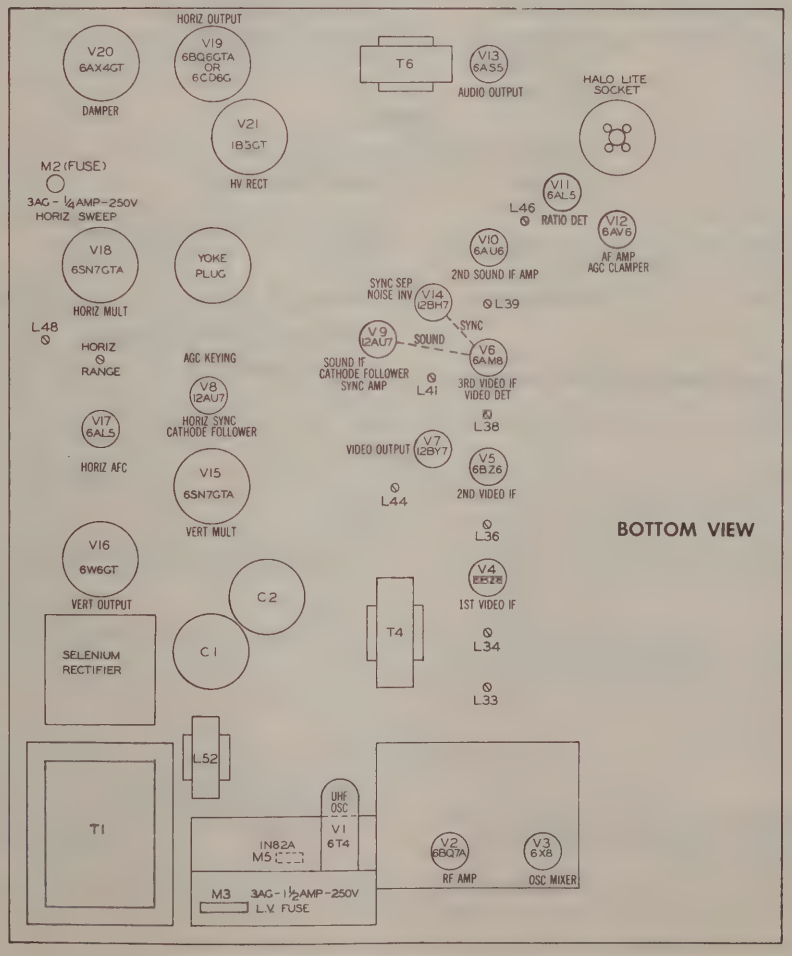
SYNC FAILURE
No vert. sync - **V9, V15**
No horiz. sync - **V8, V9, V17, V18**
No vert. or horiz. sync - **V9, V14**

SWEEP FAILURE
No raster, has sound - **V18, V19, V20, V21, V22, Fuse (M2)**
No vertical deflection - **V15, V16**
Poor vert. linearity or foldover - **V15, V16**
Poor horiz. linearity or foldover - **V18, V19, V20**
Narrow picture - **V18, V19, V20, V21, M1**
Vert. off freq. - **V9, V15**
Horiz. off freq. - **V8, V9, V17, V18**

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6T4	*†6.5KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	*†6.5KΩ		
V 2	6BQ7A	†1.2KΩ	1Meg	0Ω	0Ω	.1Ω	†1.7KΩ	1Meg	0Ω	0Ω
V 3	6X8	0Ω	8.2KΩ	†10KΩ	0Ω	.1Ω	0Ω	56KΩ	†18KΩ	†3.3KΩ
V 4	6BZ6	260KΩ	47Ω	.1Ω	0Ω	†2.2KΩ	†3.2KΩ	0Ω		
V 5	6BZ6	250KΩ	47Ω	0Ω	.1Ω	†2.2KΩ	†3.2KΩ	0Ω		
V 6	6AM8	180Ω	.1Ω	†1.4KΩ	.1Ω	0Ω	†700Ω	.2Ω	3.3KΩ	0Ω
V 7	12BY7	250Ω	3.3KΩ	0Ω	.1Ω	.1Ω	0Ω	†4KΩ	†500Ω	0Ω
V 8	12AU7	180KΩ	†45KΩ	†15KΩ	.1Ω	.1Ω	†10KΩ	1Meg	32Ω	0Ω
V 9	12AU7	†27Ω	47KΩ	2.2KΩ	0Ω	0Ω	†15KΩ	2.5Meg	0Ω	.1Ω
V 10	6AU6	1.7Ω	0Ω	.1Ω	0Ω	†2.2KΩ	†2.2KΩ	100Ω		
V 11	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	22KΩ		
V 12	6AV6	15Meg	0Ω	0Ω	.1Ω	1.1Meg	1Meg	▲1.5Meg		
V 13	6AS5	220Ω	470KΩ	.1Ω	0Ω	470KΩ	†8.2KΩ	†250Ω		
V 14	12BH7	†15KΩ	8KΩ	0Ω	0Ω	0Ω	†45KΩ	4Meg	2.7KΩ	.1Ω
V 15	6SN7GTA	10KΩ	†47KΩ	1.5KΩ	250KΩ	†330KΩ	1.5KΩ	.1Ω	0Ω	
V 16	6W6GT	NC	0Ω	†350Ω	†6.8KΩ	2.2Meg	TP	.1Ω	220Ω	
V 17	6AL5	3.3KΩ	3.3KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 18	6SN7GTA	9Meg	†47KΩ	1.5KΩ	500KΩ	†68KΩ	1.5KΩ	.1Ω	0Ω	
V 19	6BQ6GTA	TP	.1Ω	TP	†1.5KΩ	470KΩ	TP	0Ω	1Ω	Top Cap ▲14Ω
V 20	6AX4GT	INF	INF	3.5Meg	INF	†27Ω	TP	.1Ω	0Ω	
V 21	1B3GT	PINS 1 - 8 HAVE INFINITE RESISTANCE								Top Cap ▲275Ω
V 22	21YP4A	10KΩ	†750KΩ	Pin 6 ▲1Meg	Pin 10 ▲15Meg	Pin 11 †330KΩ	Pin 12 10KΩ			

* MEASURED IN "UHF" POSITION.
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V20.
TP - TIE POINT
NC - NO CONNECTION
COMMON GROUND CENTER DECK OF CHASSIS.



TUBE PLACEMENT CHART

SET 285 FOLDER 14

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19 and V20. Check M1. Check R120, R124, C105 and other associated components.

DRIVE LINES

Check by substitution V19 and V20. Check C106, C105, R120, and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V18, V19 and V20. Check C103 for open. Check R4, R116, L49, C104 and other associated components.

XMAS TREE EFFECT

Check by substitution V18, V19 and V20. Check T3 and T5 for interaal arcing. Check L49, C104, R115, R116 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R101, R100, C2C, C2D and other associated components.	Check C87, C89, C92, C90, R94, R95, R97 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V15 and V16. Check height and vertical linearity controls for proper operation. Check R97, R95, T4 and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check R95, R97, R5, R100, C89, C92 and other associated components.

COMPRESSED AT TOP

Check by substituion V15 and V16. Check R100, C2D, C93, C92 and other associated components.

FOLDS

Check by substitution V15 and V16. Check C91, C93, R100, T4, T5B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V9 and V14. Check C80, C81, C82, C83, C84, R90, R87, R82 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V15. Check vertical integrator network. Check R96, R3, R94, C89 and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V8, V17 and V18. Check C97, C98, C99, C102, C103, L49 and other associated components.

HORIZONTAL BENDING

Check by substitution V8, V9, V14, V17 and V18. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C55, C56, R46, R47, R45 and other associated components.

SOUND BARS (4.5MC Beat)

Adjust tuner fine tuning for best sound and picture. Check adjustment A9. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check contrast control. Check L44, C55, C56, R46, R47 and other associated components.

NEGATIVE PICTURE

Substitute V7. Check picture tube. Check video detector network. Check C56 and other associated components.

SMEAR

Substitute V7. Check L41, L43, L44, C56 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11, V12 and V13. Check stages V12 and V13 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C72, C73, C76, C78, R72, R76, R79, R78, T6, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A13 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

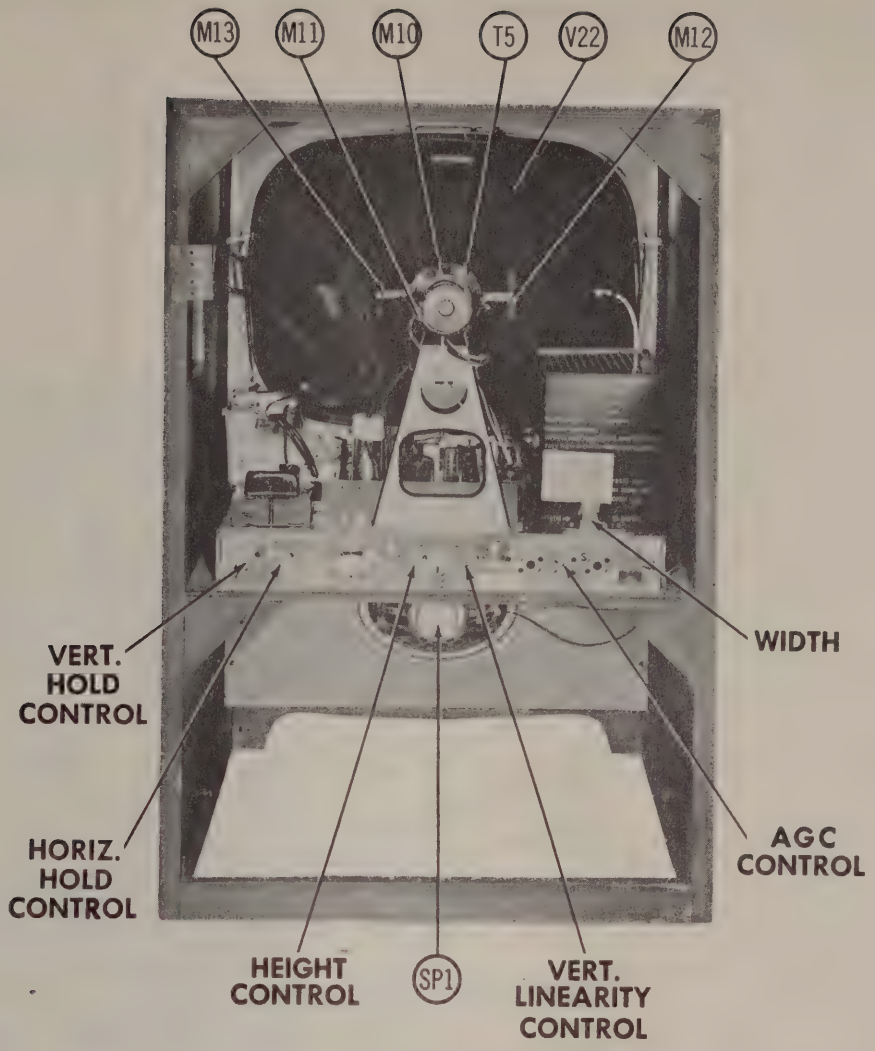
POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check M3 fuse. Check M1 and R124. Check B+ filter and decoupling network.

SMALL AND / OR DIM PICTURE

Check M1 and R124. Check B+ filter and decoupling network.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Use an isolation transformer to protect the test equipment.

Turn the set on and tune in a TV station, preferably a test pattern.

Connect a jumper from pin 8 (cathode) of V8 to chassis ground. Connect a short clip lead across horizontal oscillator coil (B1).

Set the horizontal hold control at center of its range. Adjust the horizontal range trimmer (B2) until picture locks in horizontal sync. Picture may move back and forth across screen. Remove clip lead from across B1.

Adjust the horizontal oscillator coil (B1) until picture locks in sync. Picture may move back and forth across screen. Remove jumper from pin 8 of V8. Rotate horizontal hold control slowly over its entire range; simultaneously switch off channel and back again. Picture should remain in horizontal sync. If necessary, slightly retouch B2 for proper horizontal hold. Adjust the horizontal size control for a picture slightly wider than necessary to fill the mask horizontally.

AGC CONTROL ADJUSTMENT

This adjustment has been correctly set at the factory and should normally require no further adjustment.

If adjustment becomes necessary as indicated by poor horizontal or vertical sync or receiver connected to different antenna installation, adjust as follows.

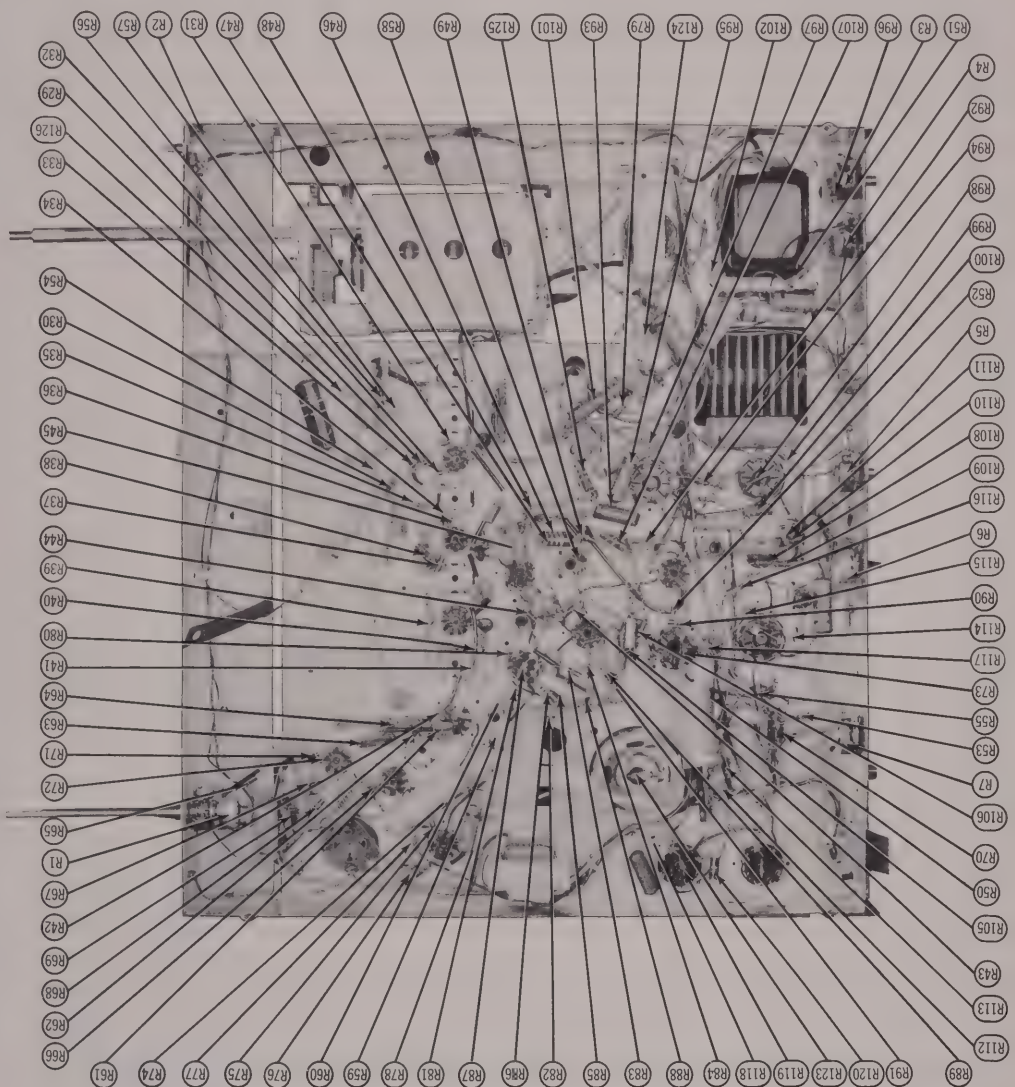
Tune in a TV station, strongest in that area. Adjust fine tuning control for the best picture.

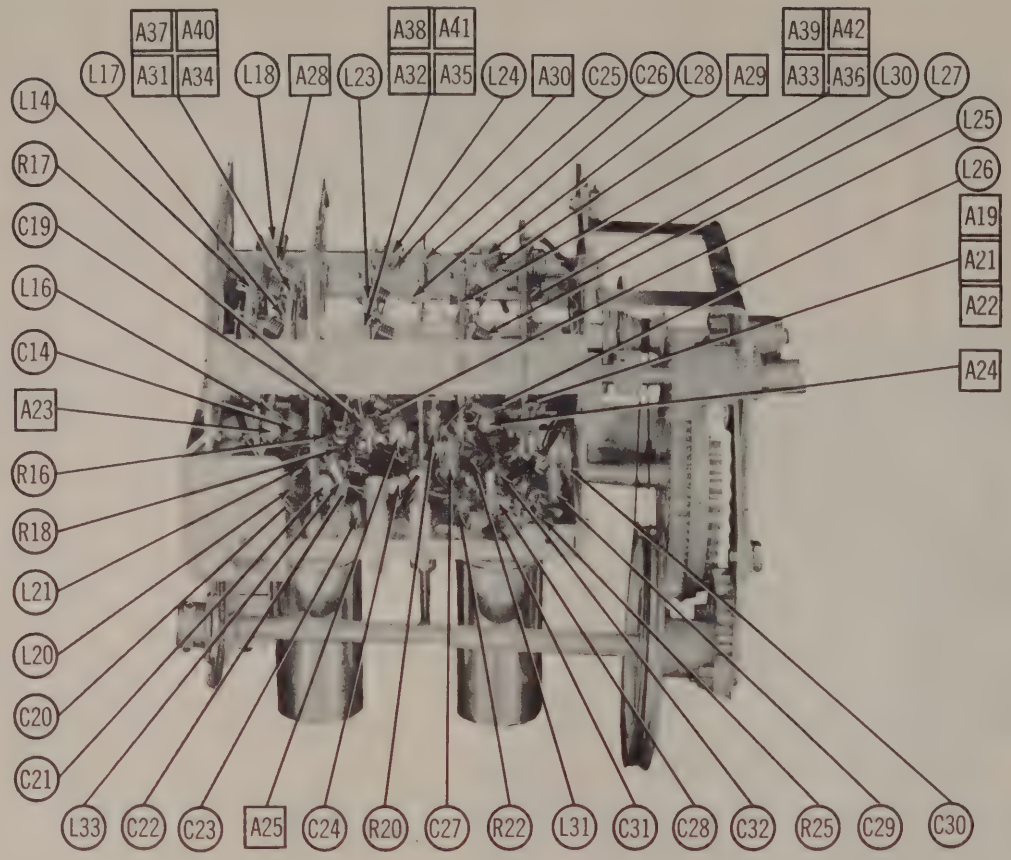
Set brightness control at normal setting and turn contrast control to approximately 7/8 maximum contrast.

Turn AGC control clockwise, blacking out the picture, then slowly turn control counter clockwise until a picture reappears and remains stable as fine tuning control is rotated through its range.

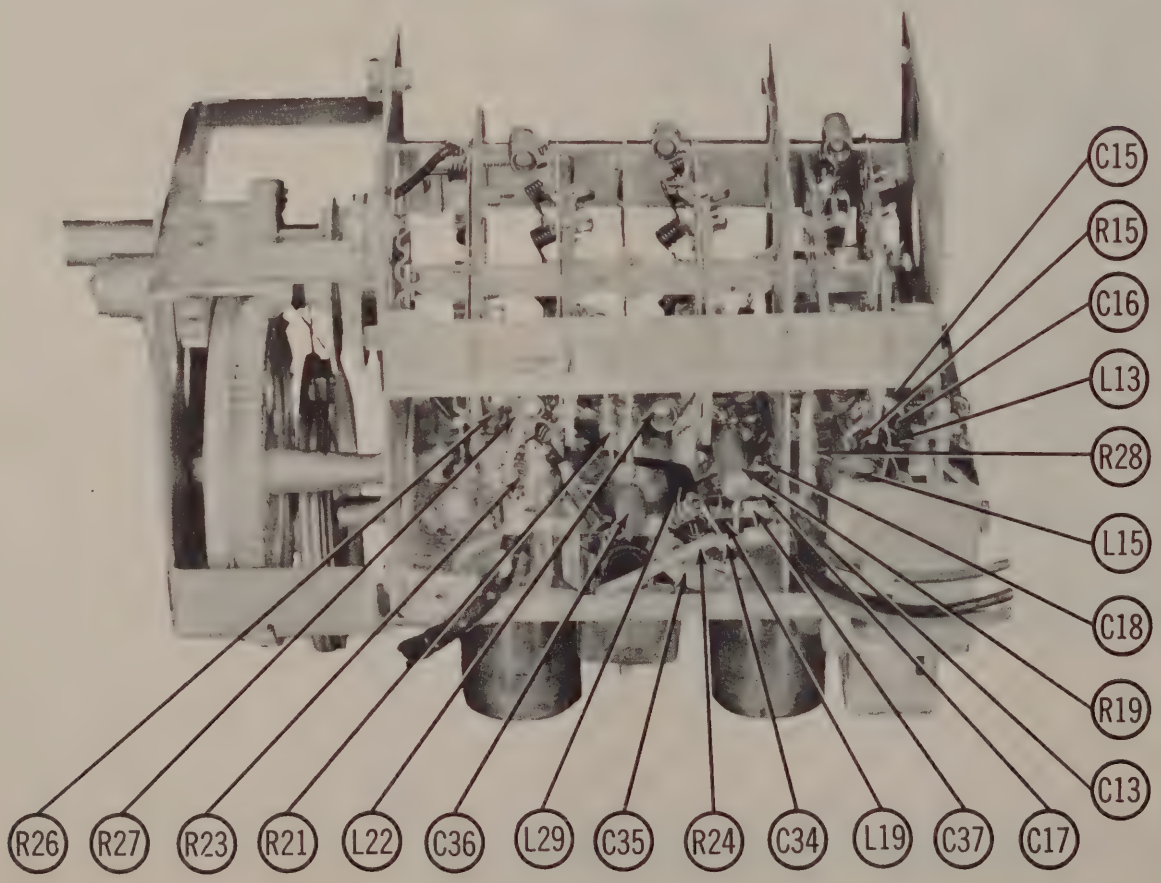
Set contrast control for normal contrast. (Do not use AGC control as contrast control.) With volume set for normal volume, readjust AGC control, if necessary, to minimize any intercarrier buzz. NOTE: Be sure sound IF is correctly aligned before adjusting AGC control for intercarrier buzz.

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION





VHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE

TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V18, V19, V20 and V21. Check M2 fuse. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C108, C107, R120, R108 and other associated components.	Check L49, C104, C105, R116, R115, R117, R114 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19 and V20. Check M1. Check R120, R124, C105 and other associated components.

BLOOMING

Check by substitution V19, V20 and V21. Check M1. Check R120, R124, C105 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined uner "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check V2, V3, V4, V5, V6 and V7. Check video IF components for failure or change of value. Raster, No Sound, No picture(UHF) substitute V1.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

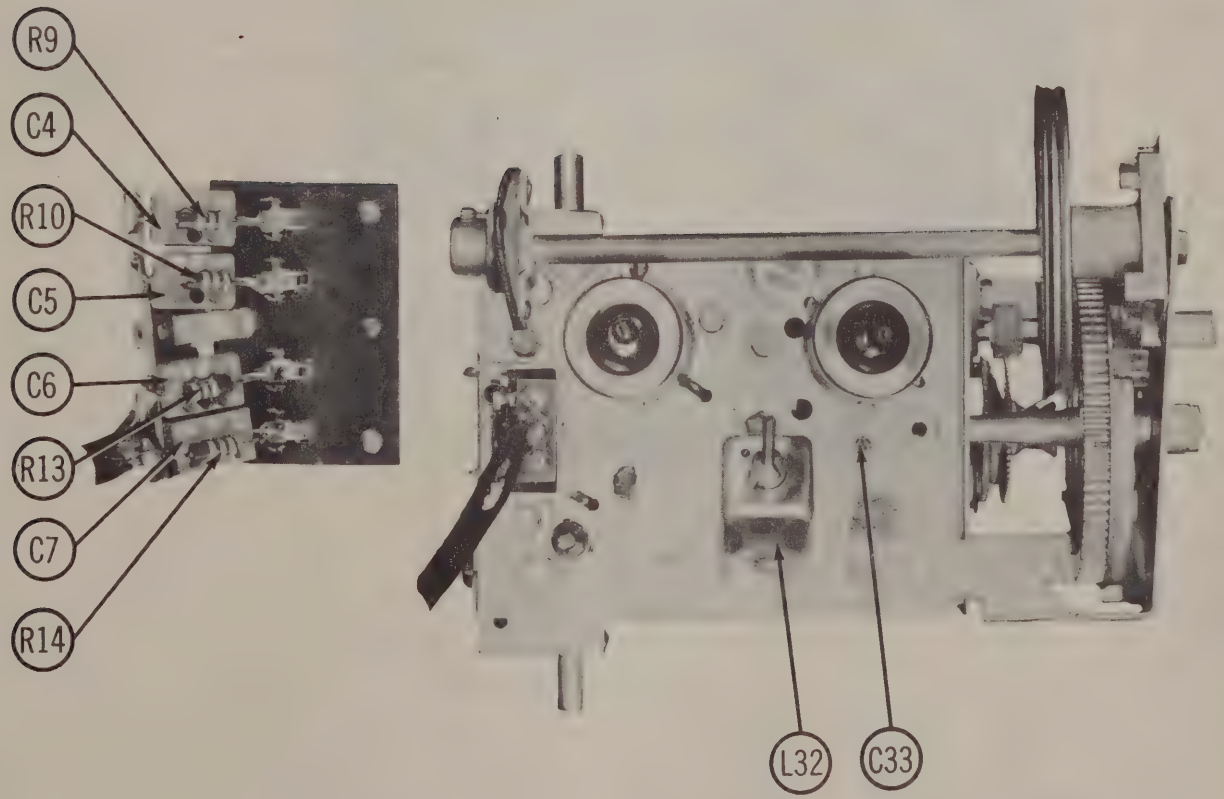
KEYSTONE EFFECT

Check T5 and its associated components.

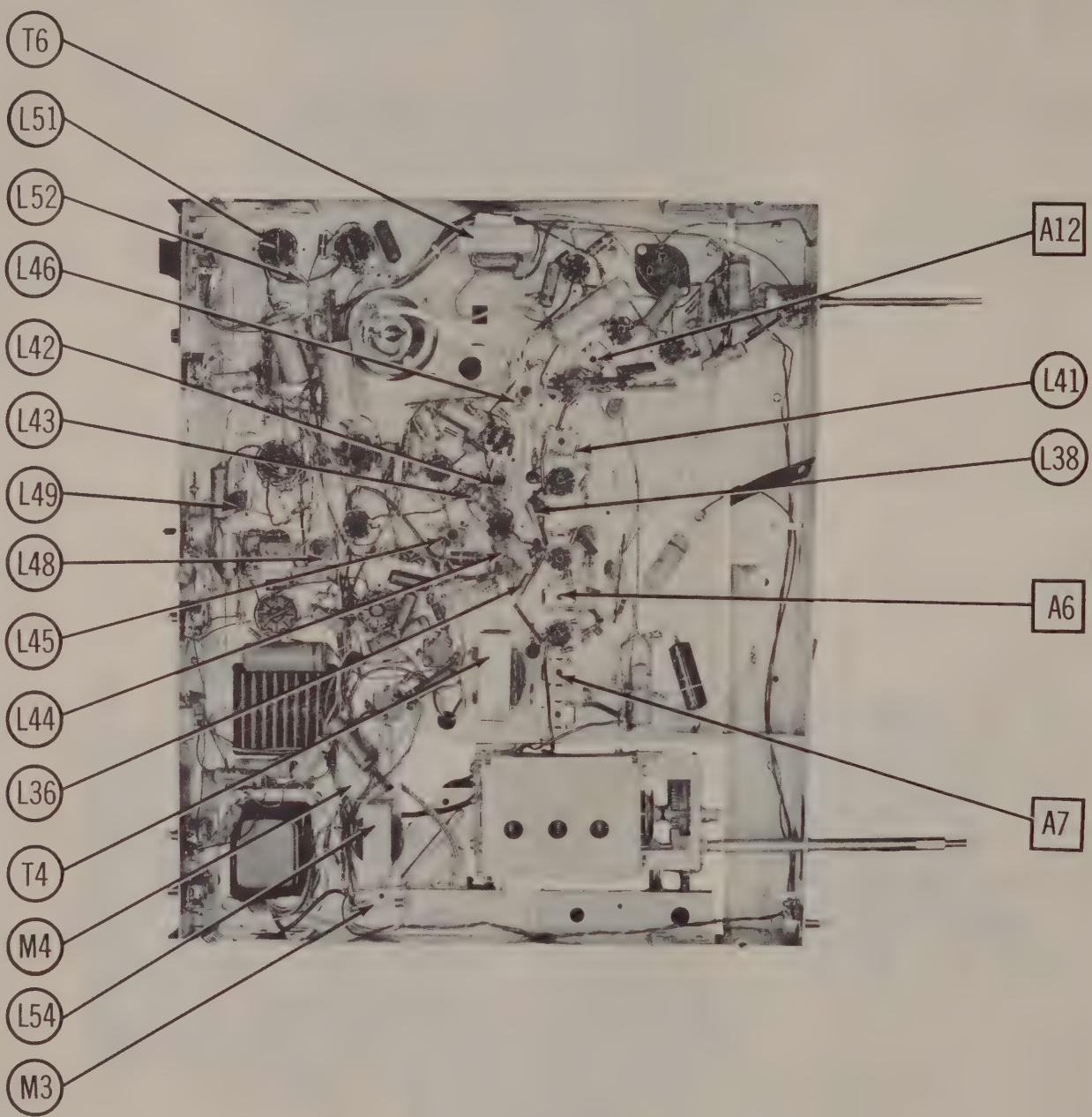
INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



UHF TUNER TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PRODUCTION CHANGES

The following changes were made in later production. Whenever possible the reason for the change is also given.

TO IMPROVE BRIGHTNESS

C58 is increased from .1MFD to .22MFD.

R50 is decreased from 15Meg to 6.8Meg.

TO ELIMINATE OSCILLATION ON CHANNELS 2 - 6.

C71 is increased from 150MMF to 1000 MMF.

L53 is added to HaloLight socket as shown on the schematic.

FOCUS ADJUSTMENT

To obtain proper brightness and focus, it may be necessary to change the focus tap. The following points are recommended. Connect pin 6 of V22 to chassis ground, boost (460V) or 155V line.

TO INCREASE RANGE OF HEIGHT CONTROL

R97 is increased from 330KΩ to 390KΩ.

TO IMPROVE FOCUS

C59 is disconnected from pin 6 of V22 and reconnected to the junction of R72 and R73. The boost voltage is connected directly to pin 6 of V22.

TO ELIMINATE RAGGED EDGE RASTER

C98 is increased from .001MFD to .01MFD.

C99 is increased from .001MFD to .01MFD.

R109 is increased from 1.8KΩ to 3.3KΩ.

C101 and R108 are omitted.

CIRCUIT REVISIONS TO INCLUDE CHASSIS 1-521-7, -8

A four position selector switch (part# 573-0010) is added to control the HaloLight. This switching arrangement is shown on the schematic.

A new UHF tuner (part #323-0061) is used in the 1-521-8 chassis. A schematic of this tuner is given below.

B2 (horizontal range adjustment) is replaced by a 56MMF capacitor.

R114 is removed from its present location and reconnected from pins 3 and 6 of V18 (horizontal oscillator) to L49 (horizontal frequency). The other end of L49 is grounded.

R116 is replaced by a 1Meg potentiometer. This control is called the horizontal range.

R1 (volume and brightness control) is changed to part #157-0040.

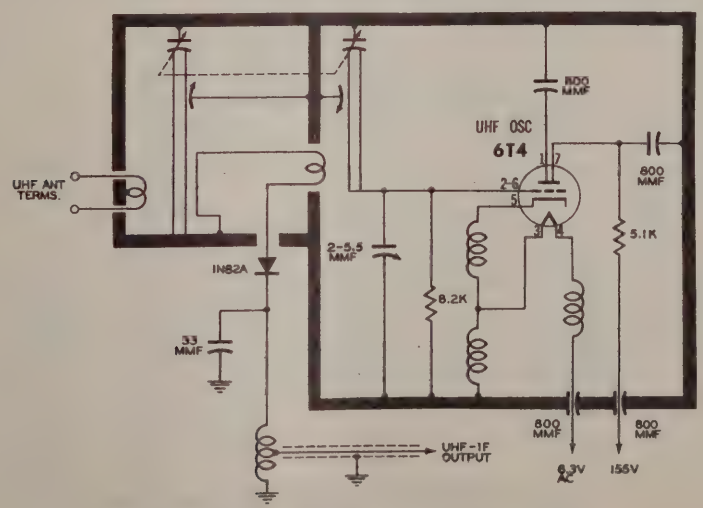
R3 (vertical hold control) is changed to part #153-0064.

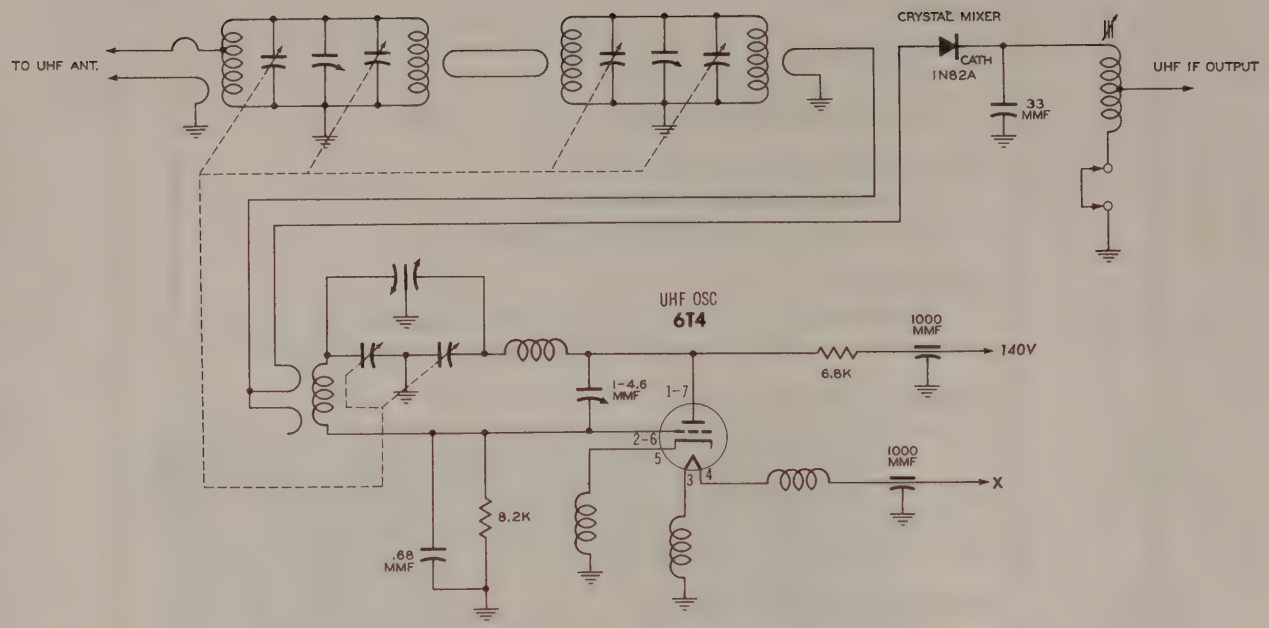
The power transformer (T1) is changed to part #141-0055.

The deflection yoke (T5) is changed to part #100-0020.

The vertical output transformer (T4) is changed to part #241-0030.

The horizontal output transformer (T3) is changed to part #241-0032. In conjunction with this change, a width coil (part #132-0006) is added across terminals #1 and #2 of T3.





ALTERNATE UHF TUNER USED WITH SOME VERSIONS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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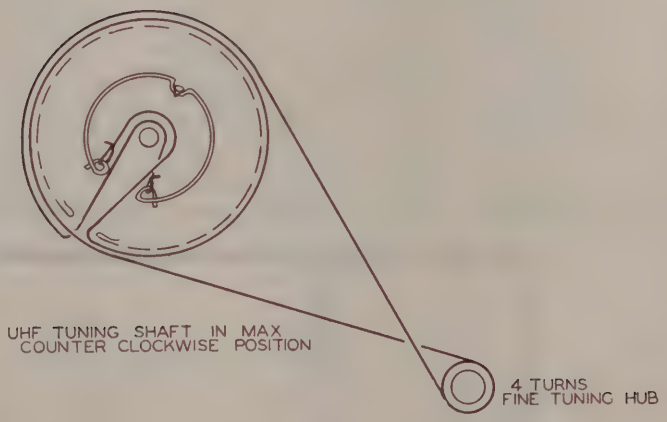
ALTERNATE UHF TUNER SCHEMATIC



UHF DRIVE CORD STRINGING

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6T4	6T4	7DK	
V2	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V3	Mixer-Osc.	6X8	6X8	9AK	
V4	1st. Video IF Amp.	6BZ6	6BZ6	7CM	
V5	2nd. Video IF Amp.	6BZ6	6BZ6	7CM	
V6	3rd. Video IF Amp-Video Detector	6AM8	6AM8	9CY	
V7	Video Output	12BY7	12BY7	9BF	
V8	AGC Keying - Horiz. Sync-Cathode Follower	12AU7	12AU7	9A	
V9	1st Sound IF-Cathode Follower-Sync Amplifier	12AU7	12AU7	9A	
V10	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amplifier-ATC Diode-AGC Clamper	6AV6	6AV6	7BT	
V13	Audio Output	6AS5	6AS5	7CV	
V14	Sync Separator-Noise Inverter	12BH7	12BH7	9A	
V15	Vert. Mult.	6SN7GTA	6SN7GTA	8BD	
V16	Vert. Output	6W6GT	6W6GT	7S	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BQ6GTA	6BQ6GTA	6AM	Chassis is not coded C00, C01 use 6CD6G
V20	Damper	6AX4GT	6AX4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	SYLVANIA PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V22	21YP4A ② 21YP4 21XP4A ② 21XP4	21YP4A ① 21YP4 21XP4	21YP4A ① 21YP4	21YP4A ② 21YP4 21XP4A ② 21XP4	21YP4A ① 21YP4	12L 12L 12L 12L	① Aluminized ② Silver screen

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	SYLVANIA PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	
C1A	▲200	250	161-2011						
B	▲200	250							
C2A	▬100	250	161-4014					Q-140	
B	▲20	250							
C	■20	250							
D	100	25							
C3	2	50	161-1001			TC302	TD-2-50	MMT-0505	
C4	470	500	163-0470	D6-471	GP2K-471				
C5	470	500	163-0470	D6-471	GP2K-471				
C6	470	500	163-0470	D6-471	GP2K-471				
C7	470	500	163-0470	D6-471	GP2K-471				
C8	.3-1.5								
C9	.5-5								
C10	800			FT-1000	357-102				
C11	800			FT-1000	357-102				
C12	30			MFT-50					
C13	10								
C14	22			D6-220	GP1K-220	UC-5422			
C15	5			TCZ-5	NP0A-050	ZT-555			
C16	220			D6-221	GP2K-221	UC-5322			
C17	800			MFT-1000					
C18	800			MFT-1000					
C19	150			DD-151	811-151	UC-5315			
C20	150			DD-151	811-151	UC-5315			
C21	5			TCZ-5	NP0A-050	ZT-555			
C22	800			DD-801	831-801	DC-521			
C23	800			DD-801	831-801	DC-521			
C24	.36								
C25	1.2			TCZ-1R2	NP0A-1R2	ZT-5515			
C26	3.3			TCZ-3R3	NP0A-3R3	ZT-5533			
C27	33			D6-330	GP1K-330	UC-5433			
C28	1.8								
C29	18								
C30	8								
C31	800			DD-801	831-801	DC-521			
C32	5			TCZ-5	NP0A-050	ZT-555			
C33	470			MFT-500					
C34	800			MFT-1000					
C35	130			TCN-130	N750-337-151				
C36	1000			DD-102	801-001	DC-521			
C37	800			MFT-1000					
C38	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C39	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C40	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C41	1000		166-1000D	DD-102	801-001	DC-521		K-1210	
C42	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C43	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C44	.22	200	160-06022			PT4022	IMP2-P22	3302022	
C45	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C46	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C47	1000		166-1000D	DD-102	801-001	DC-521		K-1210	
C48	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C49	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C50	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C51	1000		166-1000D	DD-102	801-001	DC-521		K-1210	
C52	1000		166-1000D	DD-102	801-001	DC-521		K-1210	
C53	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	SYLVANIA PART No.	CENTRALAB PART No.	ERIE PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	NOTES
			REPLACEMENT DATA						
C54	10		166-0010P	TC2-10	N90K-100	ET-541		KR-1510	
C55	47		166-0047P	D6-470	GP1K-470	UC-5447		K-1447	
C56	.22	200	160-0622			PT4023	IMP2-P22	3302223	
C57	.047	200	160-0147	DF-503		PT4147	IMP2-P47	3302147	
C58	.1	600	160-0601	DF-104		PT601	IMP6-P1	330601	Note 1
C59	.047	400	160-0147	DF-503		PT4147	IMP4-P47	3304147	
C60	.022	200	160-0223	DF-303	617-03	PT4123	IMP4-S23	3304122	
C61	470	1000	183-0470	DU138-471	1N5KV-471	CC-45347		K-45347	Note 2
C62	.22	100	160-0622			PT4022	IMP2-P22	3302022	
C63	4.7		166-0008M	TC2-4R7	N90A-4R7	ZT-555		KR-1550	
C64	4.7		166-0008P	TC2-4R7	N90A-4R7	ZT-555		KR-1550	
C65	10		166-0010P	D6-100	GP1K-100	UC-541		K-1410	
C66	4700		166-4700D	DD-472	811-0047	UC-5321		C-1247	
C67	47		166-0047P	D6-470	831-470	UC-5447		K-1447	
C68	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C69	4700		166-4700D	DD-472	811-0047	DC-525		C-1247	
C70	150		166-0150	DD-151	811-151	UC-5315		K-1315	
C71	150		166-0150	DD-151	811-151	UC-5315		K-1315	Note 3
C72A	330			D6-331	GP1K-331	UC-5333		K-1333	
	B 680		#190-0013	D6-681	GP1K-681	UC-5368		K-1368	
	C 10000			DD-103	811-01	UC-541		330611	
C73	.01	200	160-0611	D6-103	GP3-333-103	PT611	IMP4-S1	330411	
C74	.0022	200	160-0222	D6-222	GP3-332-222	PT6222	IMP6-D22	3306222	
C75	.22	200	160-0622			PT4023	IMP2-P23	3302023	
C76	.01	200	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C77	100	500	185-0100	GP1K-101		MC3255		K-1310	Note 1
C78	.01	400	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C79	.22	400	160-0622			PT4222	IMP4-P22	3304022	
C80	.22		166-0022	D6-220	GP1K-220	UC-5423		K-1423	
C81	.001	400	160-0621	D6-102	GP1L-102	PT621	IMP6-D1	330621	
C82	.01	200	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C83	.01	300	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C84	220	500	183-0220	D6-221	GP1K-221	MC340		K-1322	
C85	.022		166-0022	D6-220	GP1K-220	UC-5422		K-1422	
C86	.001	400	160-0621	D6-102	GP1L-102	PT621	IMP6-D1	330621	
C87	.01	200	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C88	.01	200	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C89	.022	200	160-0122	DF-203	817-02	PT4122	IMP4-S22	3304122	
C90	.01	300	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C91	.1	200	160-0401	DF-104		PT401	IMP2-P1	330201	
C92	.47	200	160-0647			PT4047	IMP2-P47	3302047	
C93	.047	300	160-0147	DF-503		PT4147	IMP2-S47	3302147	
C94	.047	200	160-0147	DF-503		PT4147	IMP2-S47	3302147	
C95	.1	400	160-0401	DF-104		PT401	IMP4-P1	330401	
C96	.01	200	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C97	220	500	183-0220	D6-221	GP1K-221	MC340		K-1322	
C98	.001	200	160-0621	D6-102	GP1L-102	PT621	IMP6-D1	330621	
C99	.001	200	160-0621	D6-102	GP1L-102	PT621	IMP6-D1	330621	
C100	.022	300	160-0122	DF-303	817-02	PT4123	IMP4-S23	3304123	
C101	.001	200	160-0621	D6-102	GP1L-102	PT621	IMP6-D1	330621	
C102	.001	200	160-0621	D6-102	GP1L-102	PT621	IMP6-D1	330621	
C103	.01	300	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C104	.047	200	160-0147	DF-503		PT4147	IMP2-S47	3302147	
C105	.01	300	160-0611	D6-103	GP3-333-103	PT411	IMP4-S1	330411	
C106	330	500	183-0220	D6-221	GP1K-221	MC340		K-1322	Note 4
C107	.01	400		D6-103	GP3-333-103	PT411	IMP4-S1	330411	Note 5
C108	.22	600	160-0622			PT6223	IMP6-P22	3306222	
C109	56	3000		D1250-560	3KV-560	DC-30456			
C110	.1	600	160-0601	DF-104		PT601	IMP6-P1	330601	

Note 1. Chassis coded C94 use .22MFD in this application (part #180-0622).
Note 2. Alternate part #174-0470.
Note 3. Chassis coded C01 or C05 use 1000MMF in this application (part #166-1000B).
Note 4. Chassis not coded C00 and C01 use 180MMF in this application.
Note 5. Not used in chassis coded C00 and C01.
* Items C72A, C72B, C72C and R83 are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
			REPLACEMENT DATA					
R1A	1Meg		157-0032	QJ-548			UE161T5	Brightness - Panel - Note 1
B	1Meg					AS-415	U-3	Volume & Switch - Rear
R2A	500Ω		153-0038	QJ7-105		AS-415	U-3	Contrast
B	Shaft		Not Req.	Not Req.		Not Req.	Not Req.	Attach to R3A
R3A	500KΩ		153-0036	QJ1-133	A47-500E-S	AB-59	SU-50	Vert. Hold
B	Shaft		Not Req.	Not Req.	F53-1/4	AK-1	Not Req.	Attach to R3A
R4A	100KΩ		153-0040	QJ1-126	A47-100E-S	AB-60	SU-51	Horiz. Hold
B	Shaft		Not Req.	Not Req.	F53-1/4	AK-1	Not Req.	Attach to R4A
R5A	500KΩ		153-0036	QJ1-133	A47-500E-S	BX-59	SU-50	Height
B	Shaft		Not Req.	Not Req.	F53-1/4	Not Req.	Not Req.	Attach to R5A
R6A	250KΩ		153-0033	QJ1-130	A47-250E-S	AB-58	SU-45	Vert. Linearity
B	Shaft		Not Req.	Not Req.	F53-1/4	AK-1	Not Req.	Attach to R6A
R7A	25KΩ		153-0041	QJ1-120	A47-25E-S	AB-56	SU-39	AGC
B	Shaft		Not Req.	Not Req.	F53-1/4	AK-1	Not Req.	Attach to R7A
R8A	250KΩ		153-0033	QJ1-130	A47-250E-S	AB-58	U-46	Halolight - Note 2
B	Shaft		Not Req.	Not Req.	E58-3	AK-4	Not Req.	Attach to R8A

Note 1: Versions in the 573 series will use control part #157-0036 only.
Note 2: Used in series 520, 573, 575, 576 and 577 only.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R9	470KΩ	½	181-0474	BTS-470K	
R10	470KΩ	½	181-0474	BTS-470K	
R11	10KΩ	½		BTS-10K	
R12	4700Ω	1		BTA-4700	
R13	470KΩ	½	181-0474	BTS-470K	
R14	470KΩ	½	181-0474	BTS-470K	
R15	33KΩ	½		BTS-33K	
R16	1000Ω	½		BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R17	1800Ω	½		BTS-1800	
R18	470Ω	1		BTA-470	
R19	1200Ω	1		BTA-1200	
R20	470Ω	½		BTS-470	
R21	3300Ω	½		BTS-3300	
R22	56KΩ	½		BTS-56K	
R23	18KΩ	½		BTS-18K	
R24	3300Ω	½		BTS-3300	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R26	82KΩ	½		BTS-82K	
R27	10KΩ	½		BTS-10K	
R28	1800Ω	½		BTS-1800	
R29	10KΩ	½	181-0103	BTS-10K	
R30	1000Ω	½	181-0102	BTS-1000	
R31	470Ω 5%	½	181-0475	BTS-47 5%	
R32	1000Ω	½	181-0102	BTS-1000	
R33	3300Ω	½	183-0322	BTS-3300	
R34	10KΩ	½	181-0103	BTS-10K	
R35	1000Ω	½	181-0102	BTS-1000	
R36	470Ω 5%	½	181-0475	BTS-47 5%	
R37	1000Ω	½	181-0102	BTS-1000	
R38	3300Ω	1	183-0323	BTA-3300	
R39	180Ω	½	181-0180	BTS-180	
R40	680Ω	½	181-0681	BTS-680	
R41	180Ω	½	181-0183	BTS-18K	
R42	680Ω	½	181-0681	BTS-680	
R43	3300Ω	½	181-0322	BTS-3300	
R44	3300Ω	½	181-0352	BTS-3300	
R45	33KΩ	½	181-0333	BTS-33K	
R46	8200Ω	2	183-0822	BTS-8200	
R47	8200Ω	2	183-0822	BTS-8200	
R48	2.2MΩ	½	181-0334	BTS-330K	
R49	3.3Meg	½	181-0335	BTS-3.3Meg	
R50	15Meg	½	181-0156	BTS-15Meg	Note 1
R51	680KΩ	½	181-0684	BTS-680K	
R52	33KΩ	½	181-0333	BTS-33K	
R53	22KΩ	½	181-0223	BTS-22K	
R54	220KΩ 5%	½	181-02245	BTS-220K 5%	
R55	1Meg 5%	½	181-01055	BTS-1Meg 5%	
R56	150KΩ 5%	½	181-01545	BTS-150K 5%	
R57	33KΩ	½	181-0333	BTS-33K	
R58	47KΩ	½	181-0473	BTS-47K	
R59	2200Ω	½	181-0222	BTS-2200	
R60	22KΩ	½	181-0223	BTS-22K	
R61	100Ω	½	181-010	BTS-100	
R62	2200Ω	½	181-0322	BTS-2200	
R63	100KΩ	½	#190-0013	BTS-100K	
R64	100KΩ	½	181-0104	BTS-100K	
R65	22KΩ	½	181-0223	BTS-22K	
R66	47KΩ	½	181-0473	BTS-47K	
R67	470KΩ	½	181-0474	BTS-470K	
R68	6.8Meg	½	181-06855	BTS-6.8Meg 5%	
R69	6.8Meg	½	181-06855	BTS-6.8Meg 5%	
R70	560KΩ	½	181-0564	BTS-560K	
R71	15Meg	½	181-0156	BTS-15Meg	
R72	470KΩ	½	181-0474	BTS-470K	
R73	1Meg	½	181-0105	BTS-1Meg	
R74	470KΩ	½	181-0474	BTS-470K	
R75	1000Ω	½	181-0102	BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R76	330Ω	½	183-0321	BTS-330	
R77	33KΩ	½	181-0333	BTS-33K	
R78	47KΩ	½	181-0473	BTS-47K	
R79	8200Ω	½	181-0822	BTS-8200	
R80	4700Ω	½	181-0472	BTS-4700	
R81	4700Ω 5%	½	181-04725	BTS-4700 5%	
R82	10KΩ 5%	½	181-01055	BTS-10K 5%	
R83	1Meg	½	181-0105	BTS-1Meg	
R84	470KΩ	½	181-0474	BTS-470K	
R85	2700Ω 5%	1	181-02725	BTS-2700 5%	Note 2
R86	33KΩ 5%	1	183-03335	BTA-33K 5%	
R87	33KΩ	½	181-0333	BTS-33K	
R88	2.2MΩ	½	181-0225	BTS-2.2Meg	
R89	220KΩ	½	181-0224	BTS-220K	
R90	33KΩ	½	181-0333	BTS-33K	
R91	22KΩ	½	181-0223	BTS-22K	
R92	680KΩ	½	181-0684	BTS-680K	
R93	10KΩ	½	181-0103	BTS-10K	
R94	150Ω	½	181-0151	BTS-150	
R95	47KΩ	½	181-0473	BTS-47K	
R96	100KΩ	½	181-0104	BTS-100K	
R97	330KΩ	½	181-0334	BTS-330K	
R98	2.2MΩ	½	181-0225	BTS-2.2Meg	
R99	100Ω	½	181-0101	BTS-100	
R100	220Ω	2	183-0221		
R101	6800Ω	2	183-0682	BTS-6800	
R102	12KΩ	½	181-0123	BTS-12k	
R103	560Ω	½	181-0561	BTS-560	
R104	560Ω	½	181-0561	BTS-560	
R105	1Meg	½	181-0105	BTS-1Meg	
R106	15KΩ	½	181-0153	BTS-15K	
R107	10KΩ	½	181-0103	BTA-10K	
R108	1500Ω	½	181-0152	BTS-1500	
R109	1800Ω	½	181-0182	BTS-1800	
R110	100KΩ	½	181-0104	BTS-100K	
R111	100KΩ	½	181-0104	BTS-100K	
R112	4.7Meg	½	181-0475	BTS-4.7Meg	
R113	4.7Meg	½	181-0475	BTS-4.7Meg	
R114	150Ω	½	181-0151	BTS-150	
R115	47KΩ	½	181-0473	BTS-47K	
R116	470KΩ	½	181-0474	BTS-470K	
R117	68KΩ	½	181-0683	BTS-68K	
R118	470KΩ	½	181-0474	BTS-470K	
R119	100KΩ	½	181-0103	BTS-100K	
R120	10000Ω 5%	1	183-01035	BTA-1000 5%	Note 3
R121	330Ω	½		BTS-330	Note 4
R122	1000Ω	½	181-0102	BTS-1000	
R123	4.3Ω 5%	1	189-0045		
R124	4.7Ω	5	189-0046		
R125	470Ω	1	182-0471	BTA-470	
R126	470KΩ	½	181-0474	BTS-470K	
R127	33KΩ	2	183-0333	BTS-33K	Note 5
R128	33KΩ	2	183-0333	BTS-33K	Note 5

* Items R83, C72A, C72B and C72C are combined in one unit.
Note 1: Chassis coded C04 uses a 6.8Meg resistor in this application.
Note 2: Chassis coded C03 uses a 33000 5% 1 watt resistor in this application.
Note 3: Chassis coded C01 uses a 15000 1 watt resistor in this application.
Note 4: Used in chassis C03.
Note 5: Used in series 526, 573, 575, 576 and 577 with HaloLight control.
When HaloLight control (R8) is not used, R127 and R128 (part #183-0104) use 100KΩ 2 watt resistor.

TRANSFORMER (POWER)

ITEM No	RATING PRI	RATING SEC 1	RATING SEC 2	SYLVANIA PART No.	Hallodorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
				REPLACEMENT DATA						
T1	144VAC	6.3VAC	6.3VAC	141-0045						
	.330ADC ①	5.5A	10.2A							
	117VAC									
	1.42A									

TRANSFORMER (HALOLIGHT)

ITEM No.	RATING PRI	RATING SEC 1	RATING SEC 2	SYLVANIA PART No.	Hallodorson PART No.	Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
				REPLACEMENT DATA						
T2	117VAC	1140VAC		141-0030 ①		P-5065 ②		22R43 ②		
	.14A									

① Used in models 520, 526, 573, 575, 576 and 577.
② Drill one new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	SYLVANIA PART No.	Hallodorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
		REPLACEMENT DATA							
T3	Horiz. Output Trans.	241-0026							
T4	Vert. Output Trans.	241-0018							
T5A	Yoke-Horiz(20M3)	100-0015	DF50S ①	MDF-73 ①④	223D1 ② ④	T70F20/43 ③④	A-8148 DY-11A ③④	Y-10 ①④	Y-32-1 ①④
B	Vert.(37M3)								

① Connect horizontal damping network across terminals #3 and #7. Use original network, if necessary.
② See instructions packed with unit pertaining to yoke damping network.
③ Remove damping capacitor from terminals #1 and #2. Use original horizontal damping network, if necessary.
④ Fabricate new mounting bracket.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	SYLVANIA PART No	Hallodorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
			REPLACEMENT DATA						
T6	4KΩ	3.8Ω	143-0034	21006	A-3018	A-3823	24861	S-53X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	SYLVANIA PART No.	OHMAN PART No	NOTES
				REPLACEMENT DATA		
SP1	6 x 9"	PM	3.6Ω	539-6903 ①	98A3	① Used in models 521 and 577.
	4 x 6"	PM	3.6Ω	539-4600 ②	46A07	② Used in models 520, 573, 575, 576 and 577.
	5"	PM	3.6Ω	539-0508 ③	8A07	③ Used in models 510 and 520.
	8"	PM	3.6Ω	539-0804 ④	8A31	④ Used in models 526, 573, 576 and 577.

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	SYLVANIA PART No	MEISSNER PART No	MERIT PART No	MILLER PART NO	NOTES
				REPLACEMENT DATA				
L1	UHF Ant. Input Coil	0Ω						
L2	UHF Ant. Input Coil	0Ω						
L3	UHF Ant. Coil	0Ω						
L4	UHF Mixer Coil	0Ω						
L5	UHF Mixer Coupling Coil	0Ω						
L6	UHF Osc. Coupling Coil	0Ω						
L7	UHF Osc. Coil	0Ω						
L8	FIL Choke	0Ω						
L9	FIL Choke	0Ω						
L10	Cathode Choke	0Ω						
L11	RF Choke	0Ω						
L12	UHF LF Coil	0Ω						
L13	VHF Ant.	0ΩCT	0Ω					Channels 7 - 12
L14	VHF Ant. Coils	0Ω						
L15	UHF IF Input Coil	0Ω						Tapped
L16	VHF Ant. Coil	0Ω						Channel 13
L17	VHF Ant. Coils	0Ω						Channels 2 - 5
L18	VHF Ant. Coil	0Ω						Channel 6
L19	FIL Choke	0Ω						
L20	Wave Coil	0Ω						
L21	RF Choke	2Ω						Channel 13
L22	RF Coil	0Ω						
L23	RF Coils	0Ω						Channel 6
L24	RF Coil	0Ω						
L25	UHF IF Coil	0Ω						
L26	VHF Mixer Grid Coil	0Ω						Channel 13
L27	VHF Mixer Grid Coils	0Ω						
L28	VHF Mixer Grid Coil	0Ω						Channel 6
L29	FIL Choke	0Ω						
L30	VHF Osc.Coils	0Ω						
L31	RF Choke	0Ω						
L32	Coax. Plate	0Ω						
L33	RF Choke	1.3Ω						
L34	39.75MC trap			133-0008				
L35	1st Video IF	.2Ω		113-0017	17-5003	TV-12S	6233	Includes 47.25MC trap.
L36	FIL Choke	0Ω		147-0014	19-3001	TV-19S	6804	.7 Microhenries
L37	2nd Video IF	.1Ω	.1Ω	119-0013	19-3002	TV-13T	6232	Includes 41.25MC trap.
L38	FIL Choke	0Ω		147-0014	19-3001	TV-19S	6804	.7 Microhenries
L39	3rd Video IF	.1Ω	.1Ω	119-0008	19-3004	TV-12S ④	6233 ④	
L40	4th Video IF	.1Ω	.3Ω	136-0004	19-3004	TV-12S	6234	
L41	Series Peaking Coil	1.5Ω						1.5 Microhenries
L42	4.5MC Trap	1.3Ω		118-0019	30-1004	TV-15I	1469	
L43A	Shunt Peaking Coil	7.5Ω			19-3300		4565	330 Microhenries
B	Series Peaking Coil	4.2Ω		131-3008	19-3083	TV-18I	6177	98 Microhenries
L44A	Series Peaking Coil	4.2Ω			19-3083	TV-18I	6177	98 Microhenries
B	Shunt Peaking Coil	7.5Ω		131-3008	19-3300		4565	330 Microhenries
L45	1st Sound IF	5.5Ω		130-0001	17-3400	TV-15I	1469	Tapped ② L 40
L46	2nd Sound IF	1.7Ω		130-0002			1469 ④	Tertiary winding - 10
L47	Ratio Det.	12Ω	1.6ΩCT	136-0008	17-3497	TV-21S	6205	
L48	Horiz. Sync Phase Trans.	30Ω	32Ω	243-0001				
L49	Horiz. Osc.	10Ω		129-0004	30-1029	MWC-6	6322	
L50	RF Choke	1.6Ω		118-0010	19-1005		6813	8.6 Microhenries
L51	RF Choke	1.5Ω		118-0020	19-1001		6804	1.5 Microhenries
L52	RF Choke	1.3Ω		118-0030	19-1001		6806	1.5 Microhenries
L53	Line Choke			147-0014				Used in ch. coded C05 & C01.

* Drill mounting hole.
e Detune trap winding.

FILTER CHOKE

ITEM No	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~/~	SYLVANIA PART No	Hallodorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
				REPLACEMENT DATA					
L54	250ADC	22.3Ω	.82 HY	145-0011		C5041 ①	C-3238 ①		

① Drill one new mounting hole.

RIPTIONS (Continued)

(cont)

TEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SYLVANIA PART No.	REPLACEMENT DATA IRC PART No.	NOTES
76	220Ω	2	183-0221		
77	33KΩ	½	181-0333	BTS-33K	
78	47KΩ	½	181-0473	BTS-47K	
79	8200Ω	½	181-0822	BTS-8200	
80	4700Ω	½	181-0472	BTS-4700	
81	4700Ω 5%	½	181-04725	BTS-4700 5%	
82	10KΩ 5%	½	181-01035	BTS-10K 5%	
83	1Meg	½	181-0105	BTS-1Meg	
84	470KΩ	½	181-0474	BTS-470K	
85	2700Ω 5%	1	181-02725	BTS-2700 5%	Note 2
86	33KΩ 5%	1	182-03335	BTA-33K 5%	
87	33KΩ	½	181-0333	BTS-33K	
88	2. 2Meg	½	181-0225	BTS-2. 2Meg	
89	220KΩ	½	181-0224	BTS-220K	
90	33KΩ	½	181-0333	BTS-33K	
91	22KΩ	½	181-0223	BTS-22K	
92	680KΩ	½	181-0684	BTS-680K	
93	10KΩ	½	181-0103	BTS-10K	
94	1500Ω	½	181-0152	BTS-1500	
95	47KΩ	½	181-0473	BTS-47K	
96	100KΩ	½	181-0104	BTS-100K	
97	330KΩ	½	181-0334	BTS-330K	
98	2. 2Meg	½	181-0225	BTS-2. 2Meg	
99	1000Ω	½	181-0102	BTS-1000	
100	220Ω	2	183-0221		
101	6800Ω	2	183-0682	BTB-6800	
102	12KΩ	½	181-0123	BTS-12K	
103	560Ω	½	181-0561	BTS-560	
104	560Ω	½	181-0561	BTS-560	
105	1Meg	½	181-0105	BTS-1Meg	
106	15KΩ	½	181-0153	BTS-15K	
107	10KΩ	1	181-0103	BTA-10K	
108	1500Ω	½	181-0152	BTS-1500	
109	1800Ω	½	181-0182	BTS-1800	
110	100KΩ	½	181-0104	BTS-100K	
111	100KΩ	½	181-0104	BTS-100K	
112	4. 7Meg	½	181-0475	BTS-4. 7Meg	
113	4. 7Meg	½	181-0475	BTS-4. 7Meg	
114	1500Ω	½	181-0152	BTS-1500	
115	47KΩ	½	181-0473	BTS-47K	
116	470KΩ	½	181-0474	BTS-470K	
117	68KΩ	½	181-0683	BTS-68K	
118	470KΩ	½	181-0474	BTS-470K	
119	1000Ω	½	181-0102	BTS-1000	
120	1000Ω 5%	1	182-01025	BTA-1000 5%	Note 3
121	220Ω	½		BTS-220	Note 4
122	1000Ω	½	181-0102	BTS-1000	
123	4. 3Ω 5%	1	189-0045		
124	4. 7Ω	5	189-0046		
125	470Ω	1	182-0471	BTA-470	
126	470KΩ	½	181-0474	BTS-470K	
127	33KΩ	2	183-0333	BTB-33K	Note 5
128	33KΩ	2	183-0333	BTB-33K	Note 5

one unit.
n this application.
resistor in this application.
stor in this application.

th HaloLight control.
R128 (part #183-0104) use 100KΩ 2 watt resistor.

(POWER)

REPLACEMENT DATA Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.

(HALOLIGHT)

REPLACEMENT DATA Merit PART No.	RCA TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
-3065②			22R43 ②	

EEP CIRCUITS)

REPLACEMENT DATA RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
22D1 ② ④	Y70F20/43 ①④	A-8148 DY-11A ③④	Y-10 ①④	Y-22-1 ①④

Use original network, if necessary.
ork.
al horizontal damping network, if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T6	4KΩ	3.6Ω	143-0034	Z1006	A-3018	A-3823	24S61	S-53X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA SYLVANIA PART No.	QUAM PART No.	NOTES
SP1	6 x 9"	PM	3.6Ω	539-6902 ①	69A2	① Used in models 521 and 577.
	4 x 6"	PM	3.6Ω	539-4600 ②	46A07	② Used in models 520, 573, 575, 576 and 577.
	5"	PM	3.6Ω	539-0506 ③	5A07	③ Used in models 510 and 520.
	8"	PM	3.6Ω	539-0804 ④	8A21	④ Used in models 526, 573, 576 and 577.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Input Coil	0Ω						
L2	UHF Ant. Input Coil	0Ω						
L3	UHF Ant. Coil	0Ω						
L4	UHF Mixer Coil	0Ω						
L5	UHF Mixer Coupling Coil	0Ω						
L6	UHF Osc. Coupling Coil	0Ω						
L7	UHF Osc. Coil	0Ω						
L8	Fil. Choke	0Ω						
L9	Fil. Choke	0Ω						
L10	Cathode Choke	0Ω						
L11	RF Choke	0Ω						
L12	UHF IF Coil	0Ω						
L13	VHF Ant. Trans.	0ΩCT						
L14	VHF Ant. Coils	0Ω						Channels 7 - 12
L15	UHF IF Input Coil	0Ω						Tapped
L16	VHF Ant. Coil	0Ω						Channel 13
L17	VHF Ant. Coils	0Ω						Channels 2 - 5
L18	VHF Ant. Coil	0Ω						Channel 6
L19	Fil. Choke	0Ω						
L20	Neut. Coil	0Ω						
L21	RF Choke	.2Ω						
L22	RF Coil	0Ω						Channel 13
L23	RF Coils	0Ω						
L24	RF Coil	0Ω						Channel 6
L25	UHF IF Coil	0Ω						
L26	VHF Mixer Grid Coil	0Ω						Channel 13
L27	VHF Mixer Grid Coils	0Ω						
L28	VHF Mixer Grid Coil	0Ω						Channel 6
L29	Fil. Choke	0Ω						
L30	VHF Osc. Coils	0Ω						
L31	RF Choke	0Ω						
L32	Conv. Plate	0Ω						
L33	RF Choke							
L34	39. 75MC trap			123-0005				
L35	1st Video IF	.2Ω		119-0007	17-5003	TV-128	6233	Includes 47.25MC trap.
L36	Fil. Choke	0Ω		147-0014	19-3001	TV-189	4604	.7 Microhenries
L37	2nd Video IF	.1Ω	.1Ω	119-0003	17-5002	TV-127	6232	Includes 41.25MC trap.
L38	Fil. Choke	0Ω		147-0014	19-3001	TV-189	4604	.7 Microhenries
L39	3rd Video IF	.1Ω	.1Ω	119-0006	17-5004	TV-128■	6233■	
L40	4th Video IF	.1Ω	.2Ω	126-0004	17-5004	TV-125	6234	
L41	Series Peaking Coil	1.5Ω						1.5 Microhenries
L42	4.5MC Trap	1.3Ω		118-0019	20-1004	TV-151	1469	
L43A	Shunt Peaking Coil	7.5Ω			19-3300		4565	330 Microhenries
B	Series Peaking Coil	4.2Ω		131-2008	19-3093	TV-181	6177	95 Microhenries
L44A	Series Peaking Coil	4.2Ω			19-3093	TV-181	6177	95 Microhenries
B	Shunt Peaking Coil	7.5Ω		131-2008	19-3300		4565	330 Microhenries
L45	1st Sound IF	5.5Ω		130-0001	17-3400	TV-151	1469	
L46	2nd Sound IF	1.7Ω		130-0002			1469*	Tapped② 1.4Ω
L47	Ratio Det.	12Ω	1.6ΩCT	128-0008	17-3497	TV-115	6205	Tertiary winding = 1Ω
L48	Horiz. Sync Phase Trans.	30Ω	52Ω	243-0001				
L49	Horiz. Osc.	10Ω		129-0004	20-1029	MWC-6	6322	
L50	RF Choke	1.5Ω		118-0010	19-1005		4612	9.6 Microhenries
L51	RF Choke	1.5Ω		118-0020	19-1001		4604	1.5 Microhenries
L52	RF Choke	1.3Ω		118-0020	19-1001		4604	1.5 Microhenries
L53	Line Choke			147-0014				Used in ch. coded C05 & C01.

* Drill mounting hole.
■ Detune trap winding.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L54	.280ADC	22.3Ω	.52 HY	145-0011	C5041 ①		C-2328 ①		

① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	SYLVANIA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.320A	517-0007	1022A		8S450		508	

FUSES

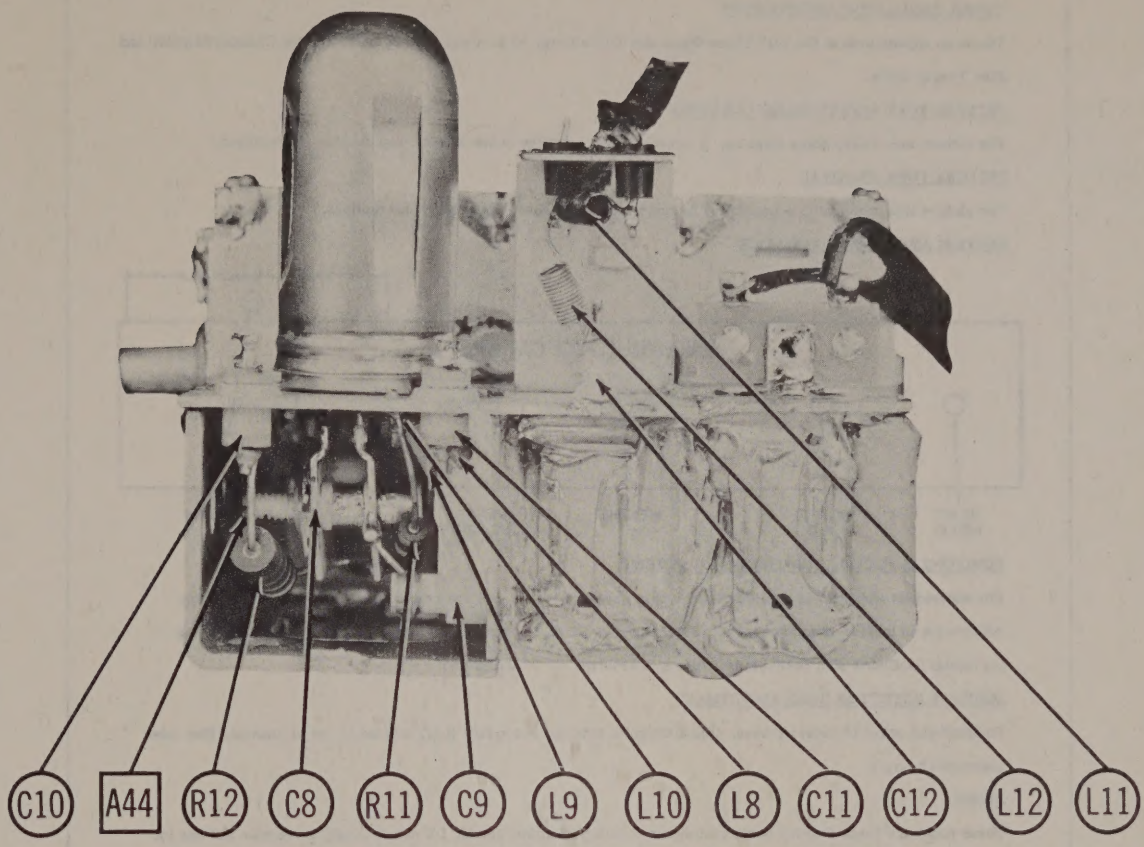
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	1/4A 250V	191-0014		313.250 (3AG-S/B-1/4A)	121004		4567
M3	3AG P/T	1½A 250V	191-0019		31801.5 (3AG-P/T-1½A)		GJV 1½A	
M4	2" of #26 wire							

CRYSTAL DIODES

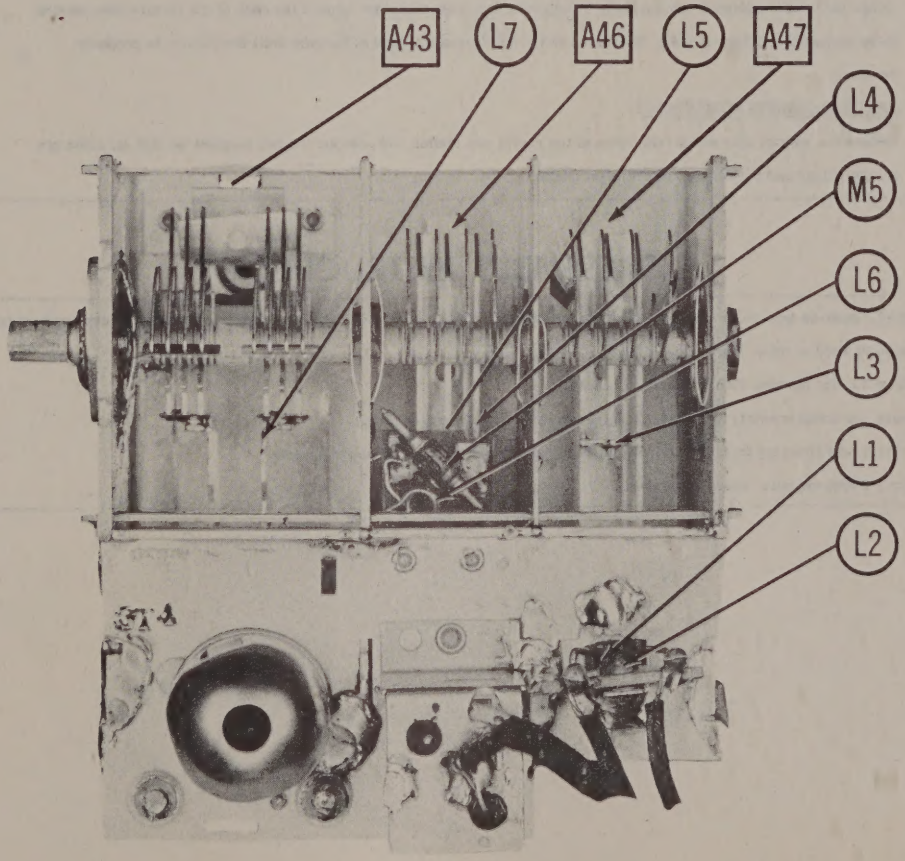
ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SYLVANIA PART No.	SYLVANIA PART No.		
M5	1N82A	1N82A or 1N82	1N82A or 1N82		UHF Mixer

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M6	HaloLight	611-2101	Used in Models 520, 526, 573, 575, 576, 577 only
M7	Tuner	323-0054	VHF - Chassis 1-521-1, -2
	Tuner	323-0055	VHF - Chassis 1-521-3
	Tuner	323-0060	VHF - Chassis 1-521-6
	Tuner	323-0062	VHF - Chassis 1-521-6
M8	Tuner	323-0051	UHF - Chassis 1-521-2, 1-521-6 (Not used in all versions of these chassis)
	Tuner	323-0059	UHF - Used in some versions of chassis 1-521-2, 1-521-6
M9	Trap	114-0003	VHF Ant. Input Filter - Chassis V-1-521-2, 1-521-6, 1-521-1
	Trap		VHF Ant. Input Filter - Chassis 1-521-3
M10	Centering Device	400-0012	
M11	Ion Trap	400-0022	
M12	Correction Magnet	400-0016	
M13	Correction Magnet	400-0016	
B2	Trimmer Cap.	172-0037	Horiz. Range (10-160MMF)
	Knob	740-0077	Contrast - Models 510, 520, 521, 526, 573, 575, 576, 577
	Knob	740-0078	Contrast - Chassis coded C05, C01 and Models 513, 517
	Knob	744-0025	HaloLight - Chassis 1-521-2, 1-521-6
	Knob	740-0063	Fine tuning and on/off/volume - Model 521
	Knob	740-0062	Fine tuning and on/off/volume - Models 510, 520,526, 573, 575, 576, 577, 513, 517
	Knob	740-0061	Brightness - Models 510, 520, 521, 513, 571
	Knob	740-0060	Brightness - Models 526, 373, 575, 576, 577
	Knob	741-0007	Channel Selector - Models 510, 520, 521, 513
	Knob	741-0006	Channel Selector - Models 526, 573, 575, 576, 577
	Knob	741-0017	Channel Selector - Model 571
	Dial	722-0036	VHF - Chassis 1-521-1, -3
	Dial	722-0035	VHF-UHF - Chassis 1-521-2, -6
	Safety Glass	710-0009	
	Mask	716-0013	Models 520, 526, 573, 575, 576, 577, 571
	Mask	716-0014	Models 510, 521
	Mask	716-0031	Model 513



UHF TUNER-RIGHT SIDE



UHF TUNER TOP VIEW

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

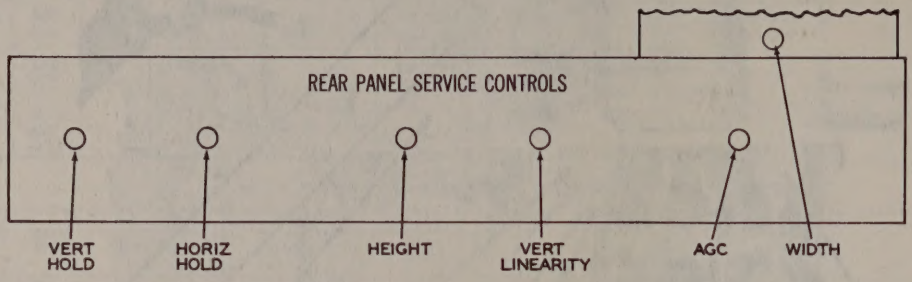
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (L49) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L47) located on top of chassis. (See tube placement chart.)

FUSES

Three fuses are used. One for horizontal sweep circuit protection, one for LV power supply protection and one for filament protection. The filament protection fuse is a 2" piece of #26 wire.

CENTERING

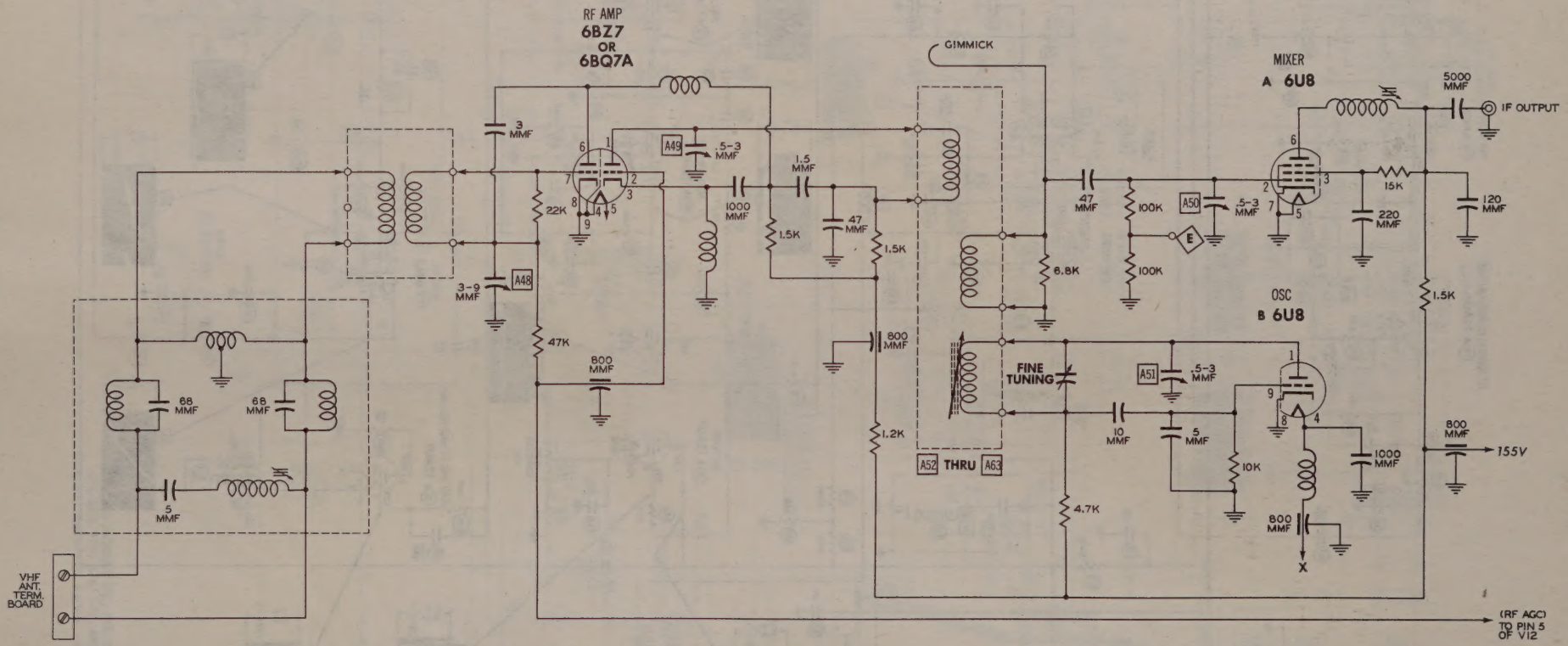
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible and position the two magnets so that all sides are straight lines and the corners are at right angles.

DISASSEMBLY INSTRUCTIONS

1. Remove 3 push-on type control knobs, loosen one metal screw on channel selector knob, remove knob and remove contrast lever.
2. Remove 10 wood screws. Remove rear cover.
3. Remove 2 metal screws. Remove antenna bracket.
4. Remove one metal screw from speaker plug cover. Disconnect speaker plug.
5. Remove 2 nuts from top front picture tube mounting and 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.



ALTERNATE VHF TUNER USED WITH SOME VERSIONS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF TUNER SCHEMATIC